Vol. LVII APRIL, 1920 New Series Vol. 10, No. 1

JOURNAL

of the

American Veterinary Medical Association

FORMERLY

AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n)

EDITED AND PUBLISHED FOR

The American Veterinary Medical Association

CONTENTS

Editorials 1

Papers:

The Canadian Army Veterinary Corps in France—D. S. Tamblyn..... 4

Further Observations of Tuberculin Testing and Retesting—Henry W. Turner 28

Heredity as Expressed by Our Stallion Registration Laws—W. H. Welch... 33

The Bacteriology of the Reproductive Organs of the Cow and Its Relation to That of the Meconium of the Calf—Ward Giltner and S. G. Bandeen.. 46

Swine Obstetrics—E. R. Tillisch..... 58

The Veterinary Corps of the American Expeditionary Forces—H. E. Bemis.. 61

Clinical and Case Reports:

Botulism in Chickens—George H. Hart..... 75

Abstracts 78

Association News:

Proceedings of the Fifty-sixth Annual Meeting of the American Veterinary Medical Association 81

Other Associations 101

Miscellaneous:

Complaints from Members..... 117

Stock Remedies, Tonics and Nostrums..... 117

The Journal of the American Veterinary Medical Association is issued the first of each month. *Manuscripts and copy for insertion should be as nearly perfect as possible for the printer and should be received by the tenth of the preceding month to insure insertion in the next month's issue.* Volumes begin in April and October.

Communications relating to publication, subscriptions, advertisements and remittances should be addressed to Journal of the American Veterinary Medical Association, 1620 Hobart St., Washington, D. C. Matters pertaining to the American Veterinary Medical Association and membership should be sent to Dr. N. S. Mayo, Secretary, 4753 Ravenswood Avenue, Chicago, Illinois.

$3.00 per annum Foreign, $3.60; Canada, $3.25 Single Copies 30 cts. in U. S.

Entered as Second Class Matter, February 4, 1920, at the Post Office at Washington, D. C., under Act of March 3, 1879. Acceptance for mailing at special rate provided for in Section 1103, Act of October 3, 1917; authorized February 4, 1920.

Arecoline Now Extracted in Our Laboratories

ARECOLINE formerly came from Europe. European concerns imported areca from the East Indies, extracted the alkaloid arecoline and then sold it to American firms. Arecoline came through many hands, and the veterinarian had to pay the long price.

We are now independent of European chemists for our supply of arecoline. We import areca, extract the pure arecoline, and convert it into hypodermic tablets—hypodermic tablets that are sterile, accurate, soluble.

Our arecoline was thoroughly tested by a number of veterinarians before it was placed on the market. These practitioners pronounced it exceptionally active and efficient.

Order a supply of our hypodermic tablets of arecoline. You will like their action. The price is low.

V. H. T. No. 524. **Arecoline Hydrobromide, 1-4 grain.** Ten tablets to a vial. Price per vial, 53 cents.

V. H. T. No. 525. **Arecoline Hydrobromide, 1-2 grain.** Ten tablets to a vial. Price per vial, 94 cents.

V. H. T. No. 526. **Arecoline Hydrobromide, 1 grain.** Ten tablets to a vial. Price per vial, $1.31.

V. H. T. No. 551. **Arecoline Compound**—Arecoline hydrobromide, 1 gr.; Physostigmine benzoate, 1/5 gr.; Strychnine sulphate, 1/4 gr. Ten tablets to a vial. Price per vial, $3.00.

V. H. T. No. 552. **Arecoline Compound, B "B."**—Arecoline Hydrobromide, 1/2 gr.; Physostigmine benzoate, 1/5 gr.; Strychnine sulphate, 1/8 gr. Ten tablets to a vial. Price per vial, $2.25.

Parke, Davis & Company

DETROIT

GOOD VETERINARIANS ALL OVER THE COUNTRY USE PURITY BIOLOGICS

BLACKLEG AGGRESSIN (Germ-Free Liquid Vaccine): Over two million calves have been immunized for life against Blackleg with one treatment. Owing to the increased demand we are able to quote you a

REDUCED PRICE OF FOURTEEN CENTS PER DOSE

HEMORRHAGIC SEPTICEMIA VACCINES for cattle and sheep prevent this disease and reduce losses in infected herds. Price, 10 cents per dose of 4 c.c.; 7½ cents for orders of 500 doses or more.

MIXED VACCINE FOR SWINE prevents Hemorrhagic Septicemia or Swine Plague, prevents losses from mixed infections. When used with Anti-Hog Cholera Serum stops "breaks" and saves revaccination. Price, 10 cents per dose of 4 c.c.; 7½ cents for orders of 500 doses or more.

PURITY ANTI-HOG CHOLERA SERUM—high in potency. Price is reasonable.

WANTED: Agents to represent us in all unoccupied territory.

ALL PRODUCTS MADE UNDER U. S. VETERINARY LICENSE NO. 39

Send for booklet
- "Blackleg and its Prevention."
- "Hog Cholera and Its Prevention."
- "Hemorrhagic Septicemia and Its Prevention."

PURITY BIOLOGICAL LABORATORIES
SIOUX CITY, IOWA

Purity Serum Company of Texas, Ft. Worth, Texas

JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n).

J. R. MOHLER, Editor, Washington, D. C.

C. A. CARY, President, Auburn, Ala. N. S. MAYO, Secretary, Chicago
M. JACOB, Treasurer, Knoxville, Tenn.

Executive Board

GEO. HILTON, 1st District; T. E. MUNCE, 2nd District; S. E. BENNETT, 3rd District, J. A. KIERNAN, 4th District; C. H. STANGE, 5th District; R. A. ARCHIBALD, 6th District; A. T. Kinsley, Member at Large.

Sub-Committee on Journal

GEO. HILTON R. A. ARCHIBALD

The American Veterinary Medical Association is not responsible for views or statements published in the JOURNAL, outside of its own authorized actions.

Reprints should be ordered in advance. A circular of prices will be sent upon application.

VOL. LVII, N. S. VOL. 10 APRIL, 1920 No. 1

FEDERAL QUARANTINE JUSTIFIED

FOLLOWING a six-months' period of Federal quarantine, which was given the military horses brought from Europe, General Pershing's horse "Kedron" received his liberty on February 23.

At that time representatives of the Bureau of Animal Industry and the Veterinary Corps, U. S. A., pronounced him healthy and in excellent condition. The mount of Col. Theodore Roosevelt Jr., which was in the same lot, received a similar bill of health—not so, however, with several other animals in the shipment.

One horse was found affected with the destructive disease, ulcerative lymphangitis. This is prevalent in the war-torn area of Europe, is contagious, and very hard to cure.

Another horse had contracted trypanosomiasis, which was caused by the entrance of one of the species of trypanosomes into the circulatory system. The disease is related to surra, nagana and other dreaded foreign scourges, also to dourine, or "equine syphilis."

Both of the horses last mentioned were killed and the carcasses destroyed by burning. In addition, the stables in which they had been kept were thoroughly cleaned and disinfected.

Another horse developed sarcoptic mange. Unlike ordinary

mange, the sarcoptic parasite burrows into the skin, forming galleries in the middle layer, and in those hiding places the mange mite is hard to reach with parasitic remedies. Still another horse died in quarantine.

The entire shipment of 116 horses which left Bordeaux, France, last August was sent to Camp Hill, the quarantine station near Newport News, Va. Aside from the four animals mentioned and two that showed slight skin lesions, the horses remained healthy.

Each horse occupied a separate box stall and never had an opportunity to come in contact with others. Each also had separate equipment, such as brushes, pails, feed boxes and halters, during the period of quarantine.

The purpose of such care and supervision, of course, is to protect the live-stock industry in the United States from contagion that exists abroad. It will be recalled that notwithstanding vigorous opposition, the quarantine regulations prevented General Pershing's horse from appearing in the various Victory parades. It will also be remembered that following the Spanish-American War General Leonard Wood was unable to bring home his "charger" from the Philippines on account of the danger of importing some oriental equine disease. In fact, according to the Federal Bureau of Animal Industry, no exceptions have ever been made to the regulations prohibiting the bringing in of live-stock from the Philippine Islands. Judging from the results obtained at Newport News, it must be conceded that the establishment of the quarantine was in every way justifiable. If the quarantine had not been established and these horses had been allowed to go free in the United States, they very probably would have been the means of spreading their infections to such an extent that it would have been necessary to spend many thousands of dollars to eradicate the maladies, even if possible of eradication. This was the experience of Great Britain following the Boer War, when large numbers of army horses were permitted to be returned from South Africa without quarantine.

ONE VETERINARIAN'S OPINION OF HOG CHOLERA SERUM

DURING the recent discussion in the House of Representatives of the item in the Agricultural Appropriation Bill providing funds for continuing the hog cholera field work during the next fiscal year, the Chairman of the House Committee on Agriculture read the

following letter from a veterinarian of Iowa, which is quoted as it appears in the *Congressional Record* of February 7, 1920:

"Dear Sir: I see the appropriation matter for fighting hog sickness is up for consideration now, so I thought I might be able to cast a little light upon the subject. You will see that I, with a lot of my patrons and friends, are interested. I am interested from a professional standpoint—a breeder myself—and for a lot of my friends and for breeders who have been stung by this serum mistake. It is a failure as a preventative and a cure. Seven years has proved that it neither prevents nor cures the disease, while, on the other hand, it has killed thousands of well hogs and spread disease into thousands of well herds and caused unnecessary expense and loss. It will continue to do so as long as it is used.

"Every dollar that Congress appropriates to further the manufacture and use of serum is only pouring oil upon the burning fire and helping a lot of fellows who are taking advantage of the conditions to graft off the unfortunate hog men.

"Stop the use of serum and spend $100,000 one year in this way, and make a lot of political soft-job grafters keep their mouths shut for one year and quit sending in false reports of how many thousand hogs serum has saved. Then we will stop the whole trouble. But as long as Congress and the Secretary of Agriculture will be dictated to and listen to these Bureau of Animal Industry serum boosters and agriculture college boosters and veterinary college boosters, who all have an ax to grind, just that long hog sickness will continue to spread and rage and cause loss. I think seven years has been long enough to aid these jobbers and grafters in their fat jobs."

So far as the veterinary profession in general is concerned this letter needs no comment, but it would be deplorable if such material should have any weight in influencing the judgment of our Congressmen in providing funds for a public service so important to the swine industry of the country. No one can tell just what effect this letter did have, but no doubt the author will take some consolation to himself in learning of the recent action of the House of Representatives, whereby the appropriation for hog cholera work was reduced from $641,045 to $410,000, which amount includes funds for the supervision of serum plants and research work, as well as control work in the field.

THE CANADIAN ARMY VETERINARY CORPS[1] IN FRANCE[1]

By LIEUTENANT-COLONEL D. S. TAMBLYN, *Canadian Army Veterinary Corps*

AT the outset I wish to point out that the Canadian Army Veterinary Corps in France and Belgium during the campaign came under the Director of Veterinary Services of the British forces, and it was from him through his Deputy Director of Veterinary Services that the Assistant Director of Veterinary Services, Canadian Corps, received his instructions. While the Canadian forces were proudly a possessor of a Director of Veterinary Services, who resided in London and formed part of the Canadian staff at that point, his jurisdiction was restricted to those units in England.

COMPOSITION

The Canadian Army Veterinary Corps was composed of the following:

44 officers, C. A. V. C.
163 other ranks.

This personnel was distributed as follows:

	Veterinary Officers	*Other Ranks*
Assistant Director of Veterinary Services	1	
Deputy Assistant Director of Veterinary Services	4	
Canadian Corps veterinary evacuating station	1	38
Canadian Corps troops	1	1
Mobile veterinary sections	4	52
Canadian railway troops	1	1
Divisional trains	4	4
Infantry brigades	12	20
Artillery brigades	11	34
Divisional ammunition columns	5	13
	44	163

FUNCTIONS AND METHOD OF PROCEDURE

Assistant Director of Veterinary Services

This officer was head of the Canadian Army Veterinary Corps within Canadian Corps. He was directly responsible to General Officer Commanding Canadian Corps, through the Deputy Adjutant

[1] Paper presented at the fifty-sixth annual meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

and Quartermaster General, for the welfare and care of all animals. He administered the divisions of the corps through the Deputy Assistant Directors of Veterinary Services of those formations. Corps troops and all units attached were administered by him direct. He insured that the veterinary administration and attendance of units left in the line when divisions moved, and all units arriving within the Corps area, were provided for. His administration was confined, as far as possible, to practical matters, so that his duties would take him more out in the field than in office, and so that by constant and systematic inspection of units and supervision in all matters affecting Veterinary Services and animals generally, disease was prevented and wastage kept down to the lowest degree. Decentralization of administration was his guiding principle.

The Remount Service of the Canadian Corps also came under his administration, so that in reality he filled a dual position, and in this regard his duties differed from those of an Imperial Assistant Director of Veterinary Services and were more arduous.

The position held by the Assistant Director of Veterinary Services was a very important one, as the efficiency and effectiveness of the Canadian Army Veterinary Corps rested entirely on his shoulders.

Canadian Corps Veterinary Evacuating Station

This unit was commanded by a veterinary officer with the rank of major and a personnel of 38 noncommissioned officers and other ranks, and acted as a casualty clearing station for the mobile veterinary sections of the divisions and Corps troops. Animals received were shipped to base hospitals, at which points minor and major operations were performed. During the animals' sojourn at the veterinary evacuating station temporary treatment was provided and everything done to alleviate suffering. The care of animals generally was all that could be asked for at this particular unit.

Deputy Assistant Directors of Veterinary Services

These officers were responsible to divisional commanders and Assistant Director of Veterinary Services, Corps Headquarters, and they administered their particular divisions. Their responsibilities were of a more active nature than those of the Assistant Director of Veterinary Services, but in a smaller way. They had to be alive to the general condition of the animals with a view of determining any cause of wastage, while they were also responsible in seeing

that shoeing, grooming, feeding, and sanitation of transport and wagon lines were not neglected, and further, that all contagious and infectious diseases were kept in check so as to prevent any large outbreak. These officers had also to deal with the demands for remounts and keep a correct check of all animal strengths and account for losses in all forms. Their services as instructional officers, in the form of lecturers to officers, noncommissioned officers and men of divisional trains, infantry transport and artillery wagon lines, were a very important part of their duties. The inspection of veterinary equipment was regularly carried out.

Mobile Veterinary Sections

Apart from the foregoing, the Deputy Assistant Directors had under their administration, attached to the division, the mobile veterinary section, which was a very necessary unit for handling sick and wounded animals. This section took over from units all sick and wounded animals, which were generally transferred to Canadian Corps veterinary evacuating station. When the division was in battle formation advanced posts were put out with a view of receiving wounded animals and giving "first aid" treatment. It was from these posts that all severely wounded cases were collected and sent by ambulance to mobile veterinary sections.

Veterinary Officers

The duties of veterinary officers in infantry brigades, artillery brigades, divisional ammunition columns, railway troops, engineer brigades, cavalry brigades and Corps troops were practically the same. They were responsible to their officer commanding and their Deputy Director of Veterinary Services. Their duties called for very sound judgment relative to animal management in the field, and it was upon the veterinary officer that the officer commanding depended for advice in this connection. A considerable amount of their work was carried out under shell fire in the vicinity of the line, while they were held responsible to the Deputy Assistant Directors of Veterinary Services for the correct accounting for all animals under their charge.

Sergeants, Canadian Army Veterinary Corps

The duties of these indispensable noncommissioned officers were to render first aid services in the absence of the veterinary officer, and to draw attention of the veterinary officer to sick and injured animals, especially suspected cases of infectious and contagious

diseases, or any irregularities in animal management which came under their notice. Their duties also called upon them to fulfil the veterinary officers' instructions relative to medicinal treatment and dressing of wounds, etc., or in other words to see that the veterinary officers' instructions were carried out to the letter.

Canadian Army Veterinary Corps Reinforcements

In the field, reinforcements for the Canadian Army Veterinary Corps were obtained from Canadian Army Veterinary Corps base details in France.

Drugs and Instruments

Each veterinary officer was supplied with a field veterinary chest containing drugs and instruments complete, as also a wallet for first-aid work, which were sufficient to meet current demands. A 25-pound unit chest, for use in cases of emergency, was supplied to units. Sergeants, Canadian Army Veterinary Corps, were supplied with a veterinary wallet. These chests and wallets were refilled from time to time from the base on indent through the Assistant Director of Veterinary Services, Corps Headquarters.

Serums and Antitoxins

These were made use of to a great extent both from a prophylactic and a curative point of view.

Remarks

Since the functions of the Veterinary Services as a whole in the field were directed toward reducing to the lowest possible degree wastage of animal strength, no more accurate indication of the conduct of these services can be given than a statement of percentages by comparison in wastage. For purposes of this paper the percentages of animal wastage in the Canadian Corps during the months of December, 1917, and January, February and March, 1918, are compared with the percentages of wastage for the same period in the army of which the Canadian Corps formed a part. These four months were selected for two reasons, viz.: (1) They constitute the season in the field during which the highest percentage of wastage from sickness and accident may be expected to occur. (2) During the months indicated, the Canadian Corps was continually in action.

Percentage of wastage, Canadian Corps.....56 per cent
Percentage of wastage, total army.....74 per cent

The average for the Canadian Corps was thus 18 per cent lower than the other corps forming part of this army. It will be understood that these percentages included wastage from enemy fire as well.

Animal Strength

The general average strength of animals in Canadian Corps was approximately 23,500. Apart from the foregoing, there were at times Imperial divisions and artillery brigades attached to Canadian Corps including the Canadian animals, and the total number for veterinary administration often reached the high figure of 50,000 in one week.

I may point out that this important branch of the service was little heard of; in fact, one might term it the "silent branch," but when consideration is given to the fact that the mobility of troops depended absolutely on the animal transport it will be seen that the necessity of maintaining a high standard of efficiency in the animals themselves was of vital importance.

SUGGESTIONS MADE FOR IMPROVEMENT

I think it would be in order for me to give you a résumé of my suggestions submitted to the War Office regarding alterations which could be advantageously made to the organization of Canadian Army Veterinary Corps or Royal Army Veterinary Corps with a division. Many of these were accepted.

1. *State generally what alterations, if any, could advantageously be made to the organization of Royal Army Veterinary Corps with a division.*

The establishment of a division should be increased to 12 veterinary officers and 30 sergeants, A. V. C., distributed as follows:

Present Establishment, Veterinary Officers of Division

Deputy Assistant Director of Veterinary Services, divisional headquarters—major	1
Divisional train—captain	1
Three infantry brigades—lieutenants	3
Divisional ammunition column—lieutenant	1
Two artillery brigades—lieutenants	2
	8

Present Establishment, Sergeants, A. V. C., of Division

Three infantry brigades	3
Divisional ammunition column	3

Artillery brigades	8
Machine-gun battalion	1
	15

Proposed Establishment

Deputy Assistant Director of Veterinary Services, divisional headquarters—major	1
Divisional train—captain	1
Four infantry brigades—lieutenants	4
Divisional ammunition column—lieutenant	1
Three artillery brigades—lieutenants	3
Machine-gun battalion	1
Canadian Engineer brigade—lieutenant	1
	12

Sergeants, A. V. C., 30, distributed as follows:

Divisional headquarters	1
Divisional train	1
Four infantry brigades	4
Four sections divisional ammunition column	4
Twelve artillery batteries	12
Machine-gun brigade	4
Canadian Engineer brigade	4
	30

Royal Army Veterinary Corps personnel should be supplied to officers to act as batmen and grooms, total 26.

All Royal Army Veterinary Corps personnel of divisions to come under the Deputy Assistant Director of Veterinary Services, to whom they will be attached for discipline and posting within divisions, as in Royal Army Medical Corps.

Horse establishments for officers and sergeants, Royal Army Veterinary Corps, should be 54, 2 for veterinary officers (each), 1 for noncommissioned officers.

2. *Are you in favor of the mobile veterinary section as part of this division?*

Yes, I favor a mobile veterinary section as part of a division, with the following increase in personnel establishment and equipment:

1 officer (captain).
30 other ranks.

The noncommissioned officers of a mobile section should be as follows:

1 sergeant-major.
2 sergeants.
2 corporals.
1 shoeing corporal.

Increased personnel is suggested on account of the great demand for veterinary patrols from mobile veterinary sections during active operations in divisional areas. This was more felt in open warfare.

Horse establishment suggested for mobile veterinary section is as follows:

Heavy draught, 2
Riding, 30

Equipment.—Increased ambulance accommodation:

1 motor ambulance.
1 horse float (light).

The cumbersome floats as at present supplied have not proved satisfactory; they only tend to impede the work of the mobile veterinary section. Something durable and light running is what is required, and with not less than 14 inches road clearance. One general service wagon is also necessary.

Apart from the above the veterinary equipment of the mobile veterinary section is not complete and the following is required:

(1) New field veterinary chests should be planned.
(2) Field instrument chest should be supplied.
(3) Complete set of dental instruments.
(4) Electric torches on a larger scale should be issued.
(5) Complete set of hobbles.
(6) Microscope including 1/16 lens and accessories.
(7) Selection of mobile veterinary section location should be left to the Deputy Assistant Director of Veterinary Services in conjunction with Quartermaster General's Branch and not entirely to the Divisional Headquarters, Quartermaster General's Branch. Mobile veterinary section should receive priority in this connection.

The reason for the first suggestion is on account of the large wastage of drugs by the mobile veterinary section having to carry them in bulk. Two chests are required to carry the drugs of the mobile veterinary section, which should be built on a larger scale than those at present in use, while it is absolutely essential that these chests should be waterproof and thus assure all drugs being kept compact and dry, which is at times impossible to carry into effect under the present arrangement. The deterioration of drugs when exposed to wet climatic conditions must be obviously recognized without further comment.

The use of tins as containers for drugs is not satisfactory; bottles with wide-mouth tops are preferable.

The supplying of a field veterinary instrument chest is absolutely essential if it is the intention to conduct an efficient and effective mobile veterinary section. Such chests should contain an ample supply of scalpels, bullet and artery forceps, probes, etc., as well as a complete set of postmortem instruments. The non-supplying of such a chest during the past campaign has been a great handicap in the conducting of mobile veterinary work.

Relative to suggestion No. 3, "Dental Instruments," no one knows better than those who have served in the field what great inconvenience the transports have been subjected to by the non-supplying of such. Many thousands of horses and mules would never have been evacuated had such been procurable at the front. These instruments should be kept at the mobile veterinary section and any dental work performed there. Dental work should not be entrusted to sergeants. The results of the work of these noncommissioned officers are usually suicidal in this connection, as in place of the animals' teeth being improved they are very often ruined from want of technical knowledge.

Suggestion No. 4, electric torches are an indispensable article in the collecting of animals and picket work around the section. The chances of fire would be greatly minimized.

Suggestion No. 5, "Complete set of hobbles." The supplying of such does not appear essential from an army point of view, yet to my mind they are indispensable, and I think all practical-minded men of the profession will coincide with me. I therefore do not propose to dilate any further on this point.

Suggestion No. 6. I think that officers commanding mobile veterinary sections should have a knowledge of bacteriology and pathology. This would be of great advantage.

Suggestion No. 7 is important from an efficiency point of view. Preference of standings and site for a mobile veterinary section is essential, especially if it is intended to carry out even the slightest treatment and care for sick and wounded animals as they should be cared for. The location of sites of some mobile veterinary sections I have visited have been nothing more than cesspools. For want of material and proper supervision, aseptic conditions under such care are impossible, and yet results were looked for and the wastage in animal flesh expected to be kept low.

The advantages of a mobile veterinary section with a division

are many, more so in open than in trench warfare. It serves as a connecting link between the forward and the rear, which is of utmost importance when you meet with large numbers of casualties. It gives a quick means of disposing of casualties from the forward area and working in conjunction with the field veterinary hospitals an efficient and effective service is maintained, while without such the work of the Royal Army Veterinary Corps would suffer to a great extent. To my mind there is only one reply regarding the maintenance of a mobile veterinary section, and that is in the positive. The advantages are too many to go into detail here.

Every division possessed a mobile veterinary section, the function of which is to form a combined collecting station for the sick and a field veterinary hospital. It is composed of an officer, non-commissioned officers and men of the Canadian Army Veterinary Corps, and is provided with its own transport for stores and equipment. Wherever the division goes its mobile veterinary section accompanies it.

The cases sent to a mobile veterinary section are broadly of two kinds, those which will be fit again in a few days and those requiring prolonged treatment. The governing principle in working a mobile section is that it must evacuate its serious or prolonged cases in order to continue to perform its function as a collecting station in the field. The location of the mobile section is known throughout the division; it flies a distinguishing flag, and at night distinctive colored lanterns are displayed. In stationary warfare it is connected up by telephone with the headquarters of the division, and care is taken in selecting its site that suitable accommodation is provided. For example, it is no use locating a mobile veterinary section some distance from a water supply, or away from a main road.

In mobile warfare the section, in addition to receiving sick, has also to collect any animals abandoned by the division. There are always some which at the last moment are found unable to accompany their units, and these are left behind with a horse recovery form and with the full knowledge that they will not be neglected. When a division is moving, its mobile veterinary section is the last to march off, and time is thus given to collect waifs and strays and make a final evacuation of those animals intended for hospital.

Every animal sent to a field veterinary section is accompanied by a form which gives the name of the unit to which it belongs, the disease from which it is suffering and a description of the animal

for the purpose of identification. On admission this is checked, the diagnosis verified and a serial number allotted which is placed on a label tied to the head collar. A special colored label is also tied on, embodying the ascertained facts regarding the cause of inefficiency, a white label being used for medical cases, green for surgical, red for contagious and blue for casting. In addition each animal bears a stencil mark in paint on the quarter, showing the number of the mobile veterinary section to which it belongs.

A careful examination of all patients received by a veterinary section is of the utmost importance, for it is here that cases of contagious diseases may be caught in their earliest stages. If the system described is followed out, it is known at once to which unit of the division the animal belongs, and notification of the existence of contagious disease is sent it as a warning.

No more important duty exists than the early and thorough examination of the sick, otherwise cases of incurable and highly infectious diseases, such as glanders, will be sent back to the base and mixed up on the way with unaffected horses. Great judgment is also required in deciding which of the ordinary cases may with advantage be retained for treatment and which should go back to base hospitals. Every animal sent back unnecessarily is a loss to the division and a source of expense to the state.

3. *Have you any other proposals or suggestions to put forward with regard to the general organization and composition of Royal Army Veterinary Corps with a division?*

(1) I would point out that the unit chest supplied is inadequate and too fragile. Such a chest should be built of a more solid material and be waterproof. The containers should be bottles and not tins. A watch-case atomizer in place of the old iodine bottle and brush. The inclusion of an enema pump; brass dressing syringe; dressing scissors; bistoury, P. P.; probe, 10-inch; forceps, bullet 12-inch; searching knife.

(2) Abolishing of all officers' field chests. By substituting such a unit chest as described above, the officers' field chest could very well be done away with.

(3) Remodeling of officers' and sergeants' wallets. Officers' wallets to be in the nature of a first-aid surgical equipment. Sergeants' first-aid medical equipment.

(4) Increased office personnel for Deputy Assistant Director of Veterinary Services: 1 staff sergeant, 1 sergeant, 1 other rank. The reason for this increase is that under this proposed scheme the entire

Remount Service above railway head would be handled by the Royal Army Veterinary Corps as now in Canadian formations.

(5) Dispensing with all horse advisors. Such appointments within a division only interfere with animal management in the field and lessen the efficiency of the transport generally. The services of the Royal Army Veterinary Corps officers should be taken advantage of more often in all matters appertaining to the care and management of animals, i. e., construction of standings, feeding, watering, stabling, sanitation, bodily hygiene, clipping, reports on ill-fitting harness, etc. More scope to Assistant Directors of Veterinary Services and Deputy Assistant Directors of Veterinary Services is the only means of bringing out the practical ability of any administrative officer and to insure results.

Further, we require to get in touch with all branches of the service more than we do and interest the senior officers as to the importance of the Royal Army Veterinary Corps. They do not understand us, so that it is our duty to educate them along our ways of thinking. Senior officers do not realize the great assistance this branch of the service could be to them and their command, nor do they, in many cases, appreciate its work, so that the profession in the Army in the future is what we make it.

(6) There should be attached to the Deputy Assistant Director of Veterinary Services office one veterinary officer as an assistant. This officer would perform the following duties:

(*a*) Remount services within the division.
(*b*) Lecturer to horse units throughout the division. (This officer would follow a definite line in his lecture so that the care of animals would be coordinated throughout the division, thus bringing one policy into force.)
(*c*) To act as executive officer to Divisional Headquarters and attached unit.
(*d*) To replace temporarily officer casualties.

(7) Elimination of horses with poor conformation and of old age. Authority should be given to Assistant Directors of Veterinary Services and Deputy Assistant Directors of Veterinary Services to condemn such animals. The condemning brand should be applied to the animals immediately with a view to disposing of them to whatever market is available. Such action would bring about financial saving as well as increasing efficiency generally.

(*a*) Relieve congestion at base hospitals.
(*b*) Would eliminate all unserviceable animals which are of no real service to the unit.

(*c*) Would save railway transportation.

(*d*) Would prevent such animals being returned to the front, which is of the greatest importance, for animals so returned seldom last a month, and consequently are immediately turned into the mobile veterinary section.

It will therefore be seen that the cost in transporting these animals to and from the base hospitals as well as feeding them is not justifiable to say the least.

(8) Motor car for Assistant Directors of Veterinary Services and Deputy Assistant Directors of Veterinary Servicee. To enable these officers to carry on their duties satisfactorily and effectively, it is absolutely essential that a car be placed at their disposal *entirely* and not be included in any pool.

(9) Telephone. This is a very necessary instrument for the Assistant Directors of Veterinary Services and Deputy Assistant Directors of Veterinary Services offices.

(10) Typewriter. This is essential so as to prepare reports and circular letters and assure neatness of rendering.

(11) The foregoing facilities must be afforded Assistant Directors of Veterinary Services and Deputy Assistant Directors of Veterinary Services. If this is not done, then senior officers of this branch of the service are not in a position to criticize the work of the junior. This must be obvious without further comment.

(12) Permanent wagon line officers. Permanent wagon line officers for artillery batteries are of the utmost importance. The artillery officer of today is too busy with the tactical end of his work, consequently the artillery horses suffer. This lack of supervision within artillery horse lines affects this branch of the service to a great extent, for unless we have proper supervision in such lines the animals go down in condition, thereby increasing our wastage and bringing undue criticism to this branch of the service. Therefore it is necessary for us to take every possible step to have the artillery establishment so altered to include an officer *who would not be a gunner but a horseman.*

(13) The regulations relative to the evacuation of animals for veterinary reasons should be reconstructed in such a manner as to give any veterinary officer the authority to make such evacuations as he may see fit. For the officer commanding any particular unit to have the authority to refuse to evacuate any animal when advised to do so interferes with the mobility of the unit's transport.

A more favorable consideration of suggestions put forward by

Assistant Directors of Veterinary Services and Deputy Assistant Directors of Veterinary Services. The lack of interest in and adoption of such suggestions is appalling and disheartening to say the least, and it only tends to lead to lack of interest on the part of junior officers. Why this should be is more than one can tell. It would appear that senior officers were afraid to deviate from the line laid down by their predecessor.

Veterinary examination stations. This term incorrectly describes the stations. I do not consider that we were obtaining the best results from our veterinary examining stations. I would suggest that the title be changed to "mobile field veterinary hospital." Such a unit carried on as the name implies would be most useful. Minor surgical cases and debilitated animals could be treated in place of evacuating to base, thus lessening the congestion at base hospitals, and railway transportation, which is so very essential in all modes of warfare. With some such change I feel sure that the efficiency and effectiveness of this branch of the service would be greatly increased. However, to carry such into effect would mean an increase in personnel to the extent of 3 officers and 75 other ranks, and the equipment to cope with the situation. Such a hospital should be used as a convalescent hospital.

Suggested corps establishment:

Assistant Director of Veterinary Services—lieutenant colonel	1
Deputy Assistant Director of Veterinary Services—major	1
Warrant officer	1
Staff sergeant	1
Sergeant	1
Other ranks	3
	8

(Note.—The 3 other ranks include batman and groom for Assistant Director of Veterinary Services and Deputy Assistant Director of Veterinary Services.)

Further Suggestions of Methods and Appliances

I also wish to bring to your attention certain suggestions offered by me from time to time and which should appeal to the officers of the American Veterinary Corps.

Convenient means by which hay can be fed.—Picket line post should be 8 feet in height above ground and a twisted wire placed from one post to another about 5 feet high, from which hay nets can be suspended. Posts should be placed at intervals of 15 feet

and should be wired to protect them. This manner of feeding hay would bring about a great saving in both hay and hay nets, as the animals will not be able to trample on them.

Watch-case atomizer.—This atomizer is put on the market by an American firm and sold by Messrs. Arnold & Sons, London. It has proved a very useful article for veterinary officers and veterinary sergeants, C. A. V. C., in the field. I purchased a large number of these, resulting in a great saving of iodine; in fact I would go so far as to say that veterinary officers waste more iodine in the dressing of one ordinary wound, with the use of the bottle and camel's hair brush as supplied, than would fill the atomizer, with which a dozen such wounds could ordinarily be dressed without refilling.

It has many advantages:

1. Convenient to carry on one's person.
2. Always at hand.
3. Less liable to break than the bottle.
4. More adaptable for dressing of wounds.
5. A more even dressing of iodine can be applied.
6. Useful in case of small punctured wounds.
7. I find that when a convenient method of dressing wounds is afforded, veterinary officers and veterinary sergeants dress the wounds more frequently and earlier, both of which are important, especially the latter.
8. Does away with the use of absorbent cotton for the application of iodine.
9. The use of such an atomizer would result in the saving of iodine, at least 75 per cent, while there would be a great saving in absorbent cotton and better results obtained.

I would strongly advise the adoption of this article, both from an efficiency and economical point of view.

Suggested distribution for a division including mobile veterinary sections, 36.

Harness.—Size issue very much too large. If a smaller size were issued a considerable saving could be brought about in leather. Animals would be able to perform their work to greater advantage. Breeching breast collar and neck straps were where most fault was found.

Halter or head collars supplied were well made and of good quality, but no difference was made regarding sizes.

Head ropes were quite good, but a hopeless article for winter use, and the animals would chew them through overnight. The chain was most serviceable.

Nose bags, supply good. Their life during winter was only a few days.

Rope hay net, a very indispensable article, and when used in conjunction with the overhead hay-net line no better means of feeding hay could be adopted. Wire hay nets were tried out but proved useless on account of animals trampling on them and difficulty in transporting.

Remounts.—Remounts were generally good, but at times unsatisfactory on account of inferior class of animals being supplied.

General faults were: Return of unserviceable animals—cribbers, wind suckers, vice, jibbers, blind; early return of animals from hospital before complete cure was obtained (quittors, mange and debility). The above vices and diseases greatly detract from the animals' utility. Such animals should be cast and sold, but in the majority of cases they were shipped to the front and in turn were immediately sent to mobile veterinary sections for evacuation, rendering no service whatever.

The English remount officials appear to judge light draft and heavy draft by the feather on the legs. Many of the heavy draft were not even light draft. In fact they often did not reach 1,000 pound—a useless animal for divisional train or ambulance work. The valuation of weight in heavy draft is most important; a horse that does not weigh at least 1,400 pounds should not be considered a heavy draft horse. In addition the weight must be the outcome of strong bone, heavy muscles, large proportions and well coupled.

Remounts received were generally in good condition, but soft, and it was very important that they should be gradually brought to work, otherwise the life of such animals in the winter months was only a few weeks, so debilitated did they become through overwork and exposure to climatic conditions; in short, such animals required a great deal of care and attention, while it was the policy to segregate them for three weeks before permitting them to mix with other animals of the unit, and have the veterinary officer certify to their freeness from contagious and infectious diseases.

Advanced aid post was found most necessary and rendered excellent service. Such a post, however, should be well in the front (under cover if possible). At these posts there should be maintained a veterinary officer or veterinary sergeant, one shoeing smith and two other ranks, for first-aid dressing is required at all times of the day and night, while the service of a farrier with spare shoes and nails is essential where fascine-made roads are traveled by pack animals in the advanced areas. Often animals pulled all four shoes and others one or two. This, however, was greatly remedied by shoeing short at the heels.

Field service horse-dipping vat.—When the vat is situated in a clay soil it is not necessary to line it with galvanized iron. On the other hand, should the soil be porous the vat must be lined with zinc or galvanized iron. The lumber shown in plan is intended for a permanent structure, but lighter lumber may be made use of if only for temporary purposes. When lumber only is used in clay soil, joints should be well caulked with tow. Bath-mats should be used at the bottom of the vat. The calcium sulphate solution should not be prepared in the vat but in tanks especially provided for this purpose. Dripping platforms and corrals may be constructed at both ends of the chute if deemed necessary. The capacity of the vat is about 2,750 gallons and 300 to 400 horses can be dipped per day. The solution may be heated by live steam from a portable engine or small heater situated level with the bottom of the vat. The vat can be drained into a cesspool by means of a drain cock in the bottom. A leg bath at the incoming end of the vat is advisable in wet climates. Running animals through this bath prior to dipping keeps the mixture free from contamination and saves replenishing the mixture as often as would be necessary without it.

The construction of standings.—Numerous suggestions have been submitted by myself and others in this connection, and it has been particularly suggested that such standings be constructed just off macadamized roads. This advice, however, was given a deaf ear, with the consequence, there is no doubt whatever, that the hard and heavy work brought about by the construction of standings far from macadamized roads, and through walking through mud knee deep, was the cause of our evacuating 25 per cent of our animals in one winter. In some instances the Canadian Field Artillery found it impossible to get to their horse standings, so deep was the mud, while in other instances they found it necessary to construct roads leading to standings, which took up enormous quantities of engineering material; in fact, so much so that it would have been far more economical to have built new standings in a suitable location and left the old standings unoccupied. This also applied to watering troughs for animals.

Horse blankets.—No action was taken to discriminate between the large and small animals when issuing blankets. At least two sizes should be issued, one for heavy draft and another for light draft saddle or pack animals. The blankets issued are too large, consequently hang very loosely, the animals therefore having a better opportunity to lay hold of them, than if they were made to fit fairly

tight around the neck, while the material used in the making would be reduced one-third. They should be double-breasted and waterproof, while a special arrangement should be worked out so as to prevent the animal from moving it out of position.

Suggestions to Prevent Wastage

In view of the great wastage in horse flesh and the difficulty in getting suitable remounts to replace those evacuated, I would suggest the following measure as a means of preventing a recurrence:

1. That a portable chaff-cutting and oat-crushing machine be supplied to each division, together with a 6-horsepower gasoline engine to run it. The cost of running such a plant would pay for itself inside a week. An engine as above mentioned would consume about 6 gallons of gasoline per day (12 hours). Three men would be required to operate the plant.

This would permit all units within the division to feed their animals half crushed oats and to chaff half their hay. I do not consider it policy to chaff all the hay; half should be fed long and at night in hay nets suspended for overhead hay-net lines, as suggested by me. This method of feeding hay has proved to save at least two-fifths of the hay ration. I would go so far as to say that overhead hay-net lines, or racks, should be insisted upon.

I would place the plant at a convenient point between the Canadian Field Artillery and the divisional train. The train could deliver half the oat and hay ration to the plant and take same back in the crushed and chaff form to the dump the following day. Units would draw from the dumps.

Such a policy in handling forage would bring about a great saving in personnel, as the issue of individual chaff-cutting machines, which take three or four men each to operate, would be entirely done away with. The worst feature of issuing chaff-cutting machines to units is that their transport facilities are too limited and therefore many look upon them as a nuisance and consequently no care is taken of the machines, which means that they are seldom in use and sooner or later are discarded.

This suggestion, if it is to be of any benefit, should be treated as a matter of great urgency, and not delayed until the animals are in that low physical condition which will take at least five months to build them up again. The advantages of crushed oats is not because the animal is unable to grind them with his teeth, but to insure that the husk of the grain is split, so that any which may escape

mastication may be readily acted upon by the gastric and other fluids during the process of digestion, thereby obtaining the best results with as little feed as possible. The feeding of hay as chaff, is, to say the least, economical, and when oats are mixed with same it insures thorough mastication.

The feeding of crushed oats and chaff has been fully demonstrated by certain units, i. e., Princess Patricia, Canadian Light Infantry, Royal Canadian Rifles, La Hore Artillery divisional ammunition column., 3d Canadian Division, Canadian Field Artillery, and others, and I venture to say that if such a method were adopted our wastage in animal flesh would be reduced 30 to 50 per cent.

Boiled feed.—This manner of feeding oats, bran and linseed during the winter assisted greatly in the maintenance of flesh, while it prevented wastage, for when not boiled bran was generally fed dry and often left exposed to the wet, while linseed would not be fed at all.

Veterinary officers supervised the feeding of these foods by insisting upon the transport officers and wagon-line officer constructing an improvised boiler usually made from an 8-foot sheet of galvanized iron and 2 by 6 foot planks. The iron was nailed on to the side of the planks and these rested on two brick or stone walls sufficiently high to permit of a fire being made underneath. The top was generally covered by a second piece of iron. This manner of boiling was most adaptable for field operations.

2. As before mentioned, permanent wagon-line officers for artillery batteries are of the utmost importance. The artillery officer of today is too busy with the tactical end of his work and consequently the horses in the wagon line suffer. It is an impossible task to keep animals in a fit condition unless there is proper supervision in the wagon lines. Many artillery officers are sent to the lines for a "rest" or some other such reason, and in the majority of these cases they are lacking in experience as far as the care of animals is concerned. This is suicidal.

There were a number of noncommissioned officers within the transport lines throughout the Division who had practical experience before the war, that would, with their militia training, have made ideal wagon-line officers, and whose services should have been taken full advantage of.

3. *Clipping operations.*—When enforced, I am in favor of the clipping of all horses, such to be taken in hand as early as possible; late clipping I oppose unless for veterinary reasons. The clipping

of mules is not of so much importance, as this animal's coat is short, thereby permitting a more thorough grooming.

By establishing three clipping stations—one at the D. A. C., one at the divisional train, and one central to the infantry brigades, the latter taking in all infantry bridges and other smaller units—you concentrate your machines and personnel, while the work is carried out under the supervision of a veterinary officer who would examine all animals for skin disease before leaving the depot. If clipping is left to units' transport officers the machines are broken and the work delayed for want of spare parts and because of differences of opinion.

Most officers are of the opinion that the wastage in animal flesh four winters ago was due to clipping. I admit that clipping *so late* did not improve conditions. I do not think, however, that we would have reduced the wastage to any extent if we had not clipped. I attribute the wastage to fast and heavy work and lack of supervision in the feeding of the animals. It is impossible, when one reviews our past experience, to expect any animal to exist on from 2 to 3 pounds of hay per day. This was all he was getting, as the balance of the hay ration was being trampled in the mud. The extreme weather conditions and exposure were also a great factor in the causing of wastage, and their effects were seen to just as great an extent in animals which had not been clipped as in those which had.

Animal condition and exercise.—It is apparent that there is often not sufficient attention given to the conditioning of animals. The wastage in animal condition of the artillery and Canadian Engineers especially was very marked, due to none other than the accumulation of fat brought on by lack of real exercise. This wastage was most noticeable after the animals were put to strenuous work in connection with field maneuvers.

Condition, as applied to animals, means thorough bodily muscular fitness for the work required. This much-desired muscular fitness can not be produced by keeping animals in standings with just one hour walking exercise and stall feeding them as one would stock for slaughter. The only way to get animals into condition, under the present circumstances, is sufficient good feed and harness exercise judicially combined. Harness exercise has many points to recommend it, i. e., animals become used to each other and their drivers, while men become accustomed to handling their teams; so that when called upon in cases of emergency, there is nothing to prevent them from moving off at a moment's notice. I therefore recommend that

where horses are not given sufficient harness work to keep them exercised they be harnessed and worked out gradually for at least two to three hours daily, Sundays included. Such a policy will produce better conditioned animals and the men will become more efficient in the handling of them.

EQUINE DUGOUTS

Equine dugouts as constructed answered the purpose for stable, wind shelter, and more particularly protected the animals from bombs and shells to a great extent, while it is almost impossible for aviators to locate them when such dugouts are camouflaged with canvas colored or with grass tufts.

Further protection against bombs and shells were sand-bags filled with earth and built up in the form of a wall on all four sides of the standing, allowing for exits on both sides.

REPORTS

Reports by veterinary officers to Deputy Assistant Directors of Veterinary Services were rendered weekly on Army Form 2000. On the front of the form is a classification of diseases, showing the total number of animals "in last return," admitted since, cured, transferred sick, died, destroyed, remaining under treatment, etc. On the back of the form is shown the wastage: Died, destroyed, evacuated, missing. With these headings it was possible to keep a most accurate animal-strength return of each unit.

The certificate on the back was given relative to infectious and contagious diseases, especially glanders and mange, while the total number of mange cases under treatment had to be shown.

This report was checked by the mobile veterinary section returns, and rechecked, as far as animal strength was concerned, by the unit's demand for remounts, which was rendered bi-weekly; so there was no possible chance of an error in so far as over or under indenting, when submitting the consolidated remount demand. Its simplicity was the greatest feature, while the casualties of horses and mules were kept separate. In short, the Deputy Assistant Director of Veterinary Services knew exactly where he stood regarding the animal strength of the division, and could check any one particular disease without trouble, and this enabled him to see at a glance just where his services were most urgently needed.

The officer commanding the mobile veterinary section rendered Army Form 2,000 weekly, also a copy of his evacuation roll whenever he evacuated animals to the base. By these two reports the

Deputy Assistant Director of Veterinary Services was able to tell just what minor cases remained at the mobile veterinary sections and which would be returned to the unit within a few days. Such animals were taken into consideration when demanding remounts, by not indenting for others to take their place.

The Deputy Assistant Director of Veterinary Services consolidated all returns rendered to his office and forwarded the same on to the Assistant Director of Veterinary Services, Canadian Corps, who in turn consolidated the divisional reports and sent them on to the Deputy Director of Veterinary Services, Army, and Quartermaster General, Canadians, London.

The Deputy Assistant Director of Veterinary Services rendered a weekly report to the General Officer Commanding of the division, and likewise the Assistant Director of Veterinary Services to the corps commander, giving a synopsis of their work during the preceding week and the general condition of the animals within the division and attached units and corps respectively. They would bring to their commander's notice any irregularity they may have noticed, and also offer suggestions as they saw fit to improve the animal management within any particular unit regarding feeding, watering, stabling, grooming, clipping, bomb and shell protection, etc.

When Assistant Directors of Veterinary Services or Deputy Assistant Directors of Veterinary Services reported adversely on any one particular unit, a copy of the report was always sent to the officer commanding of that unit or formation.

The map location of mobile veterinary sections was always wired by the Deputy Assistant Director of Veterinary Services to the Assistant Director of Veterinary Services and veterinary officers of his division whenever it moved from one location to another, as also his own location whenever the division moved.

All outbreaks of infectious or contagious diseases were reported by wire to the Assistant Director of Veterinary Services, who, after investigating same, notified the Deputy Director of Veterinary Services.

A further monthly return was also rendered to the Assistant Director of Veterinary Services, Corps, by the Deputy Assistant Director of Veterinary Services, Division, for the Quartermaster General, Canadians, information, showing number of animals received, evacuated, died and destroyed, by units. This was necessary so as to permit our Quartermaster General to keep his accounts balanced with the Imperial Remount Department so far as the supply of animals was concerned.

The Canadian Cavalry Brigade operated with the British Cavalry Corps and had its own mobile veterinary section. The veterinary service was administered by the British Cavalry Corps Assistant Director of Veterinary Services, and from what I know very excellent services were rendered. Naturally, the mobile veterinary section had to be extremely mobile, for the Cavalry Corps moved rapidly from place to place; consequently the evacuation of their sick and wounded animals had to be made through any British or Canadian veterinary evacuation station or mobile veterinary section. This was necessary so as not to interfere with their mobility, which was of the uttermost importance.

GAS HORSE RESPIRATORS AND EFFECTS OF GAS ON HORSES

The advisability of horse respirators in gas attacks is a very debatable subject. Personally I am of the opinion that the attempt to adjust respirators to animals during a gas attack, whether it be shell or cloud, is not practicable, as well as being an injustice to the men in charge of the animals.

During a cloud of gas (chlorine) attack at Ypres in 1916 no respirators were adjusted to the animals which came within reach of same, with the results that about 150 were affected and out of which only one animal was destroyed. The balance recovered in from 5 to 15 days and were returned to duty.

In two subsequent shell gas attacks (chlorine) at Vimy Ridge an attempt was made by the drivers to adjust the respirators to their horses, with the result that a number of them (both men and animals) died from gas poisoning, while a number were killed from shell-fire. It is plain that had these drivers adjusted their own respirators and driven their teams to the high ground no casualties would have occurred, either from gas or shell.

In the Ypres gas attack mentioned there is no doubt that a large number of casualties were brought about through transport officers permitting their animals to halt amongst the ruins of that town, which was a ghastly mistake, as gas only settles in such places and therefore they should be avoided.

The effect of chlorine gas on animals is an irritating effect on the lining of the bronchial tubes and respiratory membranes throughout, producing bronchial pneumonia and in the more serious cases lobar pneumonia and gangrene. The symptoms presented in chlorine gas poisoning are prostration, increased respiration, temperature, pulse and an acute cough.

The treatment followed was of a simple nature. Affected animals were kept quiet under cover and fed on mashes and green fodder, while all drinking water was brought to them. Medicinal agents used were morphia, chloral hydrate, and elexor-heroin c.c.

Mustard gas (shell) did not affect animals so extensively as the chlorine. Mustard gas was sent over by shell and mostly by long-range guns, which fire would be directed by enemy aircraft on to our transport lines. Directly this was observed the animals were cut loose and driven from the shelled area, and when Fritz decided he had done all the damage he could the shelling would cease and we would return our animals to their lines, providing of course no shells dropped within the lines, as contact with the ground where a mustard gas shell had dropped would be serious for any animal. The least touch of mustard gas on the animal's body would leave a blister which often led to the sloughing of the skin. The blistered areas were treated locally with astringents, while at outset animals so affected were washed with sodium bicarbonate solution which neutralized the action of the mustard.

EXTENT OF VETERINARY SERVICE

In the different theaters of war the Royal Army Veterinary Corps had a personnel of 1,300 officers, 27,000 other ranks and 6,000 colored men, and over 1,000,000 horses and mules to care for.

I have not touched on diseases and treatment, nor hospital work, for I have no doubt your American Army veterinary officer will go more fully into that phase of our work overseas.

We maintained a veterinary hospital at Le Havre, which was commanded by a Canadian veterinary officer, and with Canadian personnel, but under the administration of the Deputy Director of Veterinary Services, Southern (British). It received animals not only from Canadian formations but from British as well. The efficient work performed at this hospital during the campaign brought forth highly complimentary remarks from the Director of Veterinary Services (General Sir John Moore) and higher commands.

DISPOSAL OF CANADIAN ANIMALS IN FRANCE AND BELGIUM

All Canadian Animals were disposed of to the Belgian Government. The whole of this work was given into my charge as Deputy Assistant Director of Veterinary Services, Canadian Section, General Headquarters, and the handing over of same was satisfactorily completed within three months. A great deal of organization was necessary and many difficulties were encountered but we were able to over-

come them. It was an enormous undertaking on such short notice, for we had to supply four day's forage for each animal, halter and nose-bag.

Consignments were made of types according to demand and sent forward by road and rail to points which were considered the most likely markets. One man to every horse was detailed with an officer in charge. The latter, upon arrival at destination, obtained a receipt from the receiving Belgian representative for all horses, forage, halters (leather) and nose-bags, handed over by him, which was in turn handed into my office at Brussels, thus proving delivery to the Minister of Agriculture by shipments.

At the outset it was difficult to dispose of mules, but once the city commercial people realized the animals' worth for light draft work we could not supply the demand, so that our congenial friend the mule eventually won respect.

The heavy draft animal was greatly in demand, and luckily we were able to dispose of a large proportion of our so-called light draft horses under that classification, while our pack animals were disposed of to mining companies.

The Belgian Cavalry took over the majority of our riding animals.

All the animals handed over were in excellent physical condition.

Dr. E. A. Crossman, in charge of the Federal tuberculosis eradication forces in five of the New England States, gave an address on February 26 at Lawrence, Mass., under the auspices of the City Board of Health. He spoke especially of the increase of tuberculous cows and the advantages of properly pasteurized milk in overcoming the danger of infection in the milk of the afflicted cows.

Dr. Marvin Gregory, who has been in charge of tick eradication work for the Bureau of Animal Industry in the State of Arkansas for several years, resigned at the end of February to engage in dairy farming near Fayetteville, Ark. He had been in the service of the Bureau for nearly sixteen years in various capacities.

Dr. R. J. Donohue has tendered his resignation as Chief, Division of Dairy and Live Stock, Washington State Department of Agriculture, to accept a position with the Carnation Dairy Farms, where he will be connected with the management. Dr. L. C. Pelton of his force will succeed him as Chief.

FURTHER OBSERVATIONS OF TUBERCULIN TESTING AND RETESTING[1]

By HENRY W. TURNER
Harrisburg, Pa.

DURING the past two years the Pennsylvania Bureau of Animal Industry has made a number of observations on the application of the tuberculin tests and retests, which was mentioned in a paper before this Association by Marshall and Turner at Kansas City in 1917. As then stated, Dr. S. H. Gilliland had observed that ascending doses of tuberculin administered in the human subject would often cause a reaction for a period of time. Believing this to be due to the sensitization of the body cells, he pointed out that if animals which gave a suspicious reaction to the subcutaneous injection of tuberculin were to receive, 5 to 10 days later, a much larger dose, they would give a decided reaction if tuberculous, or a negative result if nontuberculous.

This observation has been further strengthened by experiments conducted at the Prussia sea quarantine stations. According to results obtained there, cattle previously treated with tuberculin will always react if five times the ordinary dose is administered.

Vallée has also shown that a reaction is obtained when double the dose is administered 36 to 48 hours after a previous injection of tuberculin. In such cases, however, the reactions set in earlier—from the fourth to the ninth hour, and are of shorter duration, hence the necessity of recording post-injection temperatures at 2-hour intervals, beginning immediately after the injection. Malm, Lignieres, Mittau and Lenders report similar experience.

From experiments conducted by the Pennsylvania Bureau of Animal Industry it was observed that the most conclusive results were obtained where the retest was made 7 days after the original test by using a double dose of tuberculin. This may be called the sensitizing method of the subcutaneous tuberculin test.

It is not our practice to retest animals which have given a reaction. In making the final decision of the results of the subcutaneous tests we are often confronted by a number of indecisive temperatures which must be classed as suspicious. This is the first condition where the 7-day retest is indicated. The second and most important

[1] Paper presented at the Fifty-sixth Annual Meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

retest is in herds where there is a large number of reactors in the original test.

The Federal Bureau of Animal Industry reports an interesting experiment in retesting along these lines. A purebred herd of 66 animals was tested for the first time under supervision, using large doses of tuberculin, and the record of the test showed that 57 reactors were found. Twenty-three of these reactors were selected for a retest in 7 days, by the subcutaneous method, the number subjected to the retest being limited to the supply of tuberculin. The 23 animals reacted the second time within 8 days. Forty-one of the reactors to the original test were slaughtered, and every animal showed well-marked lesions.

The same results have been obtained by the writer, in Pennsylvania, in testing 1,112 animals in 12 different herds, where the infection was from 1 to 70 per cent. The Pennsylvania Bureau of Animal Industry has records of over 1,000 more animals tested in the same way by other State agents.

A few herds have been selected to show the efficiency of the 7-day retest, and the results are given in tabular form. In preparing these tables other interesting points were brought out to which attention will be called later.

The dose of tuberculin was as follows: First or original test, 5 c.c., representing 0.625 c.c. old tuberculin. Second or retest in 7 days, 5 c.c. retest tuberculin, representing 1.25 c.c. old tuberculin.

HERD NO. 1

Herd No. 1 consisted of 43 animals. Results of original test, 27 positive and 16 negative.

TABLE 1—RECORD OF COMPARATIVE TESTS AND DISPOSITION OF ANIMALS HERD NO. 1

(Showing 16 animals negative and 3 positive to original test)

ANIMAL NO.	11	15	21	22	25	42	28	31	34	44	37	10	4	7	23	19	20	41	38
Subcutaneous test	N	N	N	N	N	N	N	N	N	N	N	N	P	P	P	N	N	N	N
Retest Subcutaneous 7 days later	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	N	N	N	N
Postmortem	L	L	NVL	L	NVL	L	L	NVL	NVL	L	L	L	GEN	GEN	GEN				
Disposition of carcass	F	F	F	F	F	F	F	F	F	F	F	F	C	C	C				

Nos. 11, 15, 22, 25, 42, 28, 44, 37 and 10 showed slight but definite lesions.
Explanation of symbols: N, negative; P, positive; NVL, no visible lesions; GEN, generalized; L, localized; F, food; C, condemned.

Sixty-three (63) per cent of the entire herd reacted to the original subcutaneous test. On postmortem all showed lesions, 3 being generalized. The 16 negative animals were retested in 7 days;

12 of them, or 75 per cent, reacted. On postmortem 8 showed lesions, 4 no visible lesions.

As a result of the 7-day retest, 28 per cent of the entire herd (12 animals) reacted to this test but failed to react to the original test.

HERD NO. 2

Herd No. 2 consisted of 40 grade animals. Results of the original test, 17 positive and 23 negative.

TABLE 2—RECORD OF COMPARATIVE TESTS AND DISPOSITION OF ANIMALS HERD NO. 2
(Showing 6 animals positive to the retest but negative to the original test)

ANIMAL NO. —	2	10	25	30	31	40	(36 Positive to Both Tests)
Subcutaneous test	N	N	N	N	N	N	P
Retest subcutaneous 7 days later	P	P	P	P	P	P	P
Postmortem	L	L	L	L	L	L	Generalized
Disposition of carcass	F	F	F	F	F	F	Condemned

Nos. 2, 10, 25, 30, 31 and 40 showed slight but definite lesions.

Forty-two per cent of this entire herd, or 17 animals, reacted to the original test. On postmortem all showed lesions, 4 of them being generalized. The 23 negative animals were retested in 7 days; 6 of them, or 26 per cent, reacted, all showing lesions on postmortem.

Fifteen per cent of the animals in the original subcutaneous test reacted to the 7-day retest. They had been negative to the original test.

HERD NO. 3

Herd No. 3 consisted of 84 grade animals. Results of original test, 7 positive, 1 suspicious, and 76 negative.

TABLE 3—RECORD OF COMPARATIVE TESTS AND DISPOSITION OF ANIMALS, HERD NO. 3
(Showing the reacting and suspicious animals in this herd)

ANIMAL NO. —	15	146	155	7	113	78	108	8	141	157
Subcutaneous test	P	P	P	P	P	P	P	N	N	S
Retest subcutaneous 7 days later	P	P	P	P	P	P	N	P	P	N
Postmortem	L	L	L	GENC	GENC	NVL	NVL	L	L	
Disposition of carcass	F	F	F	C	C	F	F	F	F	

Seventy-four of the seventy-six negative to the original test were negative to retest, and are not shown.

Nine per cent of the herd (7 animals) reacted to original test. On postmortem 5 showed lesions, 2 no visible lesions. The 76 negative and 1 suspicious animal were retested in 7 days, 2 of them reacting, and on postmortem both showed lesions.

Two per cent of the animals in the original subcutaneous test reacted to the 7-day retest. They had been negative to the original test.

The one suspicious animal to the original test (No. 157) was negative to the ophthalmic and retest. In a test made a year later it reacted, and on postmortem showed enlarged and caseous bronchial and mediastinal glands. This animal should have been destroyed on the original test.

HERD NO. 4

Herd No. 4 consisted of 55 grade animals. Result of original test, 40 positive, 2 suspicious and 13 negative.

TABLE NO. 4—RECORD OF COMPARATIVE TESTS AND DISPOSITION OF ANIMALS, HERD NO. 4

(Showing the reactors to the retest which were negative and suspicious to the original test, and the nine with generalized lesions on postmortem)

ANIMAL NO. —	1	11	25	32	34	35	42	9	48	4	14	19	21	26	30	39	40	44
Subcutaneous test	N	N	N	N	N	N	N	S	S	P	P	P	P	P	P	P	P	P
Retest subcutaneous 7 days later	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Postmortem	L	L	L	L	L	L	NVL	L	L	GEN C	GEN C	GEN C	GEN C	GEN C	GEN C	GEN C	GEN C	GEN C
Disposition of carcass	F	F	F	F	F	F	F	F	F									

Nos. 4, 14, 19, 21, 26, 30, 39, 40 and 44 were positive to both tests and on postmortem showed generalized lesions.

Seventy-two per cent of the herd (40 animals) reacted to original test. On postmortem all showed lesions, 9 being generalized. The 13 negative and 2 suspicious animals were retested 7 days later; 9 of them, or 60 per cent, reacted. On postmortem all showed lesions but one.

Sixteen per cent of the animals in the original subcutaneous test reacted to the 7-day retest. They had been negative to the original test.

SUMMARY OF TABLES

To summarize these tables, 222 animals were tested subcutaneously; 40 per cent reacted to the original test. There were 128 negative and 3 suspicious animals retested in 7 days; 20 per cent of them reacted to this retest.

Twelve per cent of the animals tested failed to react to the original test, but did react to the retest 7 days later.

Some interesting points were brought out in compiling these tables, one of which seems to refute the generally accepted opinion that advanced cases of tuberculosis do not always react to the tuberculin test. We found that all of the generalized cases had

reacted to the original test as well as the 7-day retest. This has been our invariable experience in herds which have been tested in this manner, with the exception of one animal.

Many of the animals which were negative to the original test, but reacted to the 7-day retest, on postmortem showed slight but definite lesions.

Generalized cases appear to react consistently, but the incubative or slightly infected cases do not always react but often require sensitization before giving a definite reaction.

An opportunity was recently afforded for making a 60-day retest in conjunction with the inspectors of the Federal Bureau of Animal Industry on 2 herds composed of 214 animals. In the original subcutaneous test 90 animals, or 42 per cent of the entire number tested, gave reactions, and on postmortem all showed lesions except one. The 124 negative and suspicious animals were retested in 60 days. Forty-six of them, or 37 per cent, reacted, and on postmortem all showed lesions. There were 39 animals which showed generalized lesions on postmortem, and all of them had reacted to the original test. In these herds 21 per cent of the animals in the initial subcutaneous test failed to react but reacted to the 60-day retest.

These results favor the early retest, as it demonstrated that 78 healthy animals had been exposed for 60 days to infection from 46 animals which were found on retest to be tuberculous, a condition which could have been ascertained in 7 days.

The efficiency of the 7-day retest has beeen clearly demonstrated in our work. It shortens the time of exposure to infection and is more economical and convenient to the owner, which is a very important phase of tuberculosis eradication.

CONCLUSIONS

Where the 7-day retest is indicated:

1. When animals have given unsatisfactory temperature measurements to the subcutaneous test.
2. In herds where a large percentage of reactors to the subcutaneous test have been found.
3. In herds where on postmortem examination the reactors to the initial test show only slight lesions, indicating that the spreader has not been detected.

HEREDITY AS EXPRESSED BY OUR STALLION REGISTRATION LAWS[1]

By W. H. WELCH

Lexington, Ill.

"LIKE produces like, or the likeness of some ancestor." This is a true maxim handed down through the ages. It is particularly applicable to animal life, and refers more specifically to anatomical outlines, color, markings, conformation, gait, individuality, etc. It is this well demonstrated principle of inherent prepotency that constantly leads progressive breeders to seek their ideals as nearly as possible in their foundation stock. It is the law of nature on which the fundamental basis of constructive scientific breeding is builded, whence through the careful selection of type, conformation, quality, and the constant culling of undesirables, we build toward that standard of perfection which we consider ideal.

"Like father, like son" is also an axiom of ancient origin oftenest applied to the human family in reference to traits of character, inherited instincts, etc. As a formula for successful live-stock breeding its wisdom finds expression and daily application in the hands of the progressive stockman, who makes a careful and painstaking selection of the sire intended for service on his high-class females, knowing that by the intelligent use of a very superior sire he will be enabled to improve measurably the standard of his herd. Its practical culmination is found in the oft-repeated statement, "A sire represents one-half the entire herd," and fabulous expenditures have been made for sires capable of adding fame and quality to an already high-class aggregation of females.

The old admonition, "We should marry our opposites," is founded on the theory of equalization and the law of compromise, reasoning that in the mating of a man and a woman both of similar type and temperatument certain strong qualities and characteristics would be so intensified in their children as to be decidedly objectionable, while in the offspring of those couples possessing opposite types (their ancestral inheritance being equal) there would result a mutual blending of all the natural instincts and characteristics peculiar to each. In animal life it is this theory that leads breeders to mate approved animals of similar type, and to seek the opposite in conformation at points wherein improvement is desired.

[1] Paper presented at the Fifty-sixth Annual Meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

"The survival of the fittest" by the selection of the finest and best specimens for seed stock has been a proverbial procedure from time immemorial. The farmer gathers from his corn the most perfect of the ears; the horticulturist grafts his finest fruits; the breeders selects his most desirable females and mates them with the best obtainable sire. Thus by the continued propagation of the choicest types, ideal specimens have been produced that have commanded the admiration of the world and set a monetary value on those certain individuals reaching into the thousands of dollars.

These are the results of intelligent constructive breeding. They are the products of the continued mating of a certain type of animal throughout several generations until that type has assumed a fixed standard of excellence. Animals bred after this fashion are remarkably prepotent, transmitting their inherent characteristics to a marvelous degree. In some instances such a sire has popularized an entire breed, and it is a notable fact that all the improvement in the characteristics peculiar to each of the different breeds has been accomplished by the intelligent use of great sires crossed on the proper type of females, dictated by a master mind.

I have attempted to indicate how through the careful and intelligent selection of a standardized type of animal continued progress may be made and the idea ultimately approached with great certainty, although the goal of perfection may never be reached. Retrogression, however, is far easier. Defective, weak and faulty conformations are fully as transmissible, aye, more heritable, than is the ideal or perfect standard, because in the ancestral inheritance of most animals there have been more defective conformations than perfect ones. As for "every effect there is a cause," so we find that for every defect there is a reason. Blemishes are largely the results of the efforts of nature to strengthen and repair weak and faulty structures, and in the heritability of blemishes these structural weaknesses must be given due consideration as being largely the primary causative factor in their production.

Let me also add that while this paper deals with the problem of the transmissibility of disease and unsoundness solely in its relationship to the stallion, I desire throughout its entire length to incriminate equally the dam on at least a fifty-fifty basis, and no reference is made to the stallion but what I desire shall apply with equal force to her. Should we mate a single-hocked dam with a stallion possessing a perfectly acceptable hind leg, justice demands that we should not hold the stallion entirely responsible for a result-

ant crooked hind leg on the foal. Our stallion laws, however, do not contemplate any action looking toward the elimination of unsound mares offered for service, so that any hoped-for improvement in the character of horses raised must be reached through the agency of the stallion kept for public service. How important, then, that in our legislation we place on our statutes stallion laws that will materially assist in the production of a better and a more valuable race of horses; laws that will cause the farmer to use the better type of stallion for a sire; laws that will exclude the common and inferior side; laws that will eliminate, or at least greatly lessen, the blemishes in future generations of horses; laws that will make for the betterment of the horse business in general.

Ask the earnest advocate of our present stallion laws if they have materially assisted in producing a better class of horses, and he cannot truthfully answer you in the affirmative. He points with pride, however, to the fact that they have been instrumental in exposing a great many stallions standing on bogus and fraudulent pedigrees, and claims that because of their enactment the percentage of grade sires standing for public service has been greatly lessened. I challenge the assertion that the present laws have been in any great manner responsible for eliminating the grade sire from service. Stockmen are fast being educated to the great value of using purebred sires not only on their mares but on their cows, their sows and their ewes, and there has been a greater percentage of grade and scrub bulls, boars and bucks eliminated from the breeding ranks than stallions. Place the right kind of a purebred stallion in a community, and the grade soon ceases to be a menace. However, these laws have been of real benefit, in that they have caused the farmer to think and to study these breeding problems. As a result he has learned to discriminate, and today is demanding a better and sounder stallion than ever before.

With the desire of putting the horse business on a "sounder" basis, 26 of our States have enacted "stallion registration laws" which, it was hoped, would tend to improve the character of the horses raised and greatly lessen or entirely eliminate certain blemishes and unsoundnesses in the future generations of equines. Under these laws certain blemishes, unsoundnesses and diseases are declared heritable and a stallion so affected is refused a license to stand for public service. Doubtless it was reasoned, inasmuch as these unsoundnesses were considered to be of a transmissible nature, that by eliminating the unsound sire from public service a conse-

quent lessening of blemishes would be apparent in the following generations. It is worthy of note, however, that in none of the 26 States was any consideration given to the unsound mare, but that all anticipated improvement was to be attained by eliminating the unsound stallion from the breeding ranks.

It is of further interest that in but 6 of the States was any attention devoted to faulty or weak conformations in the sire as being heritable features that might predispose their subsequent offspring to unsoundness. That a great diversity of opinion exists regarding the heritability of various unsoundnesses is also evident by a perusal of the laws which were enacted by the different States. An unsoundness that may disqualify a stallion for service in one State may prove no barrier to his receiving a license should he be removed to another. The laws of 5 of our States do not disqualify any stallion, but require that his blemish or unsoundness of whatsoever nature be enumerated in his license and posted on the door of his stall, where all prospective patrons may inspect it. This leaves 21 States wherein stallions may be disqualified because of unsoundness or blemish. Yet a unanimity of opinion is not recorded on a single disease. Seventeen States, however, are united in the opinion that periodic ophthalmia, bone spavin, ringbone, and curb when accompanied by curby conformation, are heritable, and stallions so affected are barred from public service. A complete list of unsoundnesses mentioned, some of which may be considered heritable by one State and in others its victim prove entirely acceptable, are enumerated as follows:

Periodic ophthalmia; cataract; glaucoma; amaurosis; glass eye.

Bone spavin; ringbone; bog spavin; sidebone.

Curb, when accompanied by a curby conformation of hock.

Laryngeal hemiplegia; roaring; whistling.

Chorea; stringhalt; crampiness; shivering.

Heaves, or broken wind.

Navicular disease; laminitis; canker of foot.

Melanosis; osteoporosis; cryptorchidy.

Venereal diseases; maladie du coit (dourine); urethral gleet; coital exanthema.

Glanders and farcy.

Mange; vicious disposition.

Weak or faulty conformation, or any serious defect liable to be transmitted to offspring.

It is worthy of note that this list includes almost every unsound-

ness of a chronic nature to which the equine flesh is heir. How the "dummy," the "bobby," and the animal affected with fistulous withers or poll evil ever escaped is difficult to surmise. It would seem that quarantine regulations would properly and adequately cover animals affected with any of the venereal diseases, glanders, mange, and all other contagious and infectious diseases, and that any mention of them in a stallion law would be entirely superfluous. All will admit their transmissibility by contact, and any discussion as to heredity is unnecessary.

Let us pass to a consideration of those different diseases declared as heritable by these various enactments.

PERIODIC OPHTHALMIA

In 17 out of the 26 States possessing stallion laws periodic ophthalmia is considered as heritable and constitutes a legal bar to receiving a license.

In the light of recent investigation, the results of which must be accepted by all fair-minded veterinarians, the etiological factor in the production of this disease has been conclusively proved to be bacterial.[1] The isolation of the specific bacillus, the reproduction of the disease by inoculation of healthy eyes and certain other indisputable facts stamp this as true beyond any question.

We must all acknowledge that periodic ophthalmia manifests no preference or partiality in the selection of its victims, being as likely to attack the best appearing eye in the herd as it is the small, inferior-looking eye that we have always viewed with a certain degree of suspicion. We further agree that when one eye in a herd has been attacked other cases are almost certain to follow, irrespective of any blood relationship that may exist between the victims, and that within a few months following its appearance a liberal percentage of horses on that farm will have lost the vision of one or both eyes ere it ceases its ravages. We usually find it developing some weeks or months following an outbreak of influenza, distemper or other inflammatory disease affecting the respiratory tract, as a sequel of those disorders.

We are further impressed of its non-transmissibility by the fact that foals sired by a stallion after he himself has fallen a victim to the disease are no more susceptible to attack than are those which he sired previously to becoming affected. To the impartial mind it seems scarcely conceivable that eyes which are perfect in appearance

[1] Dalling in *The Veterinary Journal*, London, vol. 75, No. 1.

may remain sound until the animal has reached maturity, or even for 20 or more years, and then succumb to the ravages of a heritable malady. We must in the face of all these facts accept this as a constitutional disease and not a transmissible or heritable unsoundness.

CURB

In the same 17 States a curb, only when associated with a curby conformation of the hock, is declared transmissible and a stallion thus blemished is disqualified.

A curb may be present on any type of hock other than one of a curby conformation and will in no way prejudice the stallion's right to a license. No one, I am sure, will dispute the justice of this provision, because the best shaped hock in the world is liable to become curbed. In none of these States, however, will the curby conformation alone disqualify him for public service. He must in addition to the curby conformation be actually possessed of a curb. Reasoning therefrom, we deduce the theory that a curb is not transmissible when situated on a hock of otherwise good conformation; that it is transmissible only when associated with a curby conformation; that the curby conformation which we all know predisposes the animal to the development of a curb is of no consequence; and that a stallion is a menace to the breeding interests only during such time as he is actually possessed of a curb. The curby-hocked stallion with the sled-runner legs may stand for public service until such time as he may actually develop a curb, when the law disqualifies him. Then by a successful treatment the curb may be reduced and the animal once more becomes eligible to a license. Are there any who affirm that a greater percentage of curbs would exist among his offspring sired during the time he was condemned as being possessed of a curb than before or after that time, when he was technically free from that blemish?

Inferentially these laws say that even though a stallion possesses a curby conformation his offspring will be sound so long as he himself does not actually possess a curb, but the moment that he develops a curb on that curby conformation he at once becomes a menace to the breeding interests and is disqualified for service. In other words, the blemish is heritable; the predisposing causes are of no consequence. What inconsistency! If our laws referring to curb do not contemplate the eliminating of stallions possessing a curby or faulty conformation of hock, regardless of the actual

presence or absence of the curb, then we have made no progress in the elimination of curbs from the future generations of the equine race, and that section of the law might as well never have been written.

BONE SPAVIN AND BOG SPAVIN

Seventeen States agree that bone spavin is a heritable blemish, while 12 assert that bog spavin is a serious menace to the breeding interests.

There is no disputing the fact that weak and faulty conformations are responsible for nine-tenths of the entire group of hock lamenesses and blemishes. A too-crooked hock is without doubt the most palpable defect with which we have to contend in the breeding business, as it predisposes the animal not only to the early development of bone spavin, bog spavin, thoroughpins and curb, but may well be considered an accomplice in the production of ringbone as well. Added to this is the hind leg that is too straight, which, while not so easily curbed, is a strong factor in the etiology of both bone spavin and bogs.

Faulty or defective conformation of hock should disqualify any stallion, even though he cannot technically be classed as unsound, because among his get there will be found just as many hock blemishes as though he himself were actually so diseased. Let us eliminate the stallion with the ill-shaped hock from public service, and in a generation we shall have done more toward the eradication of bone spavin, bog spavins, curbs, thoroughpins, ringbones and other kindred ailments than can be accomplished in a century of the present plan.

RINGBONE

There are certain heritable conformations of the pastern that predispose animals to the development of ringbone. The too-long pastern that stands too straight and the coon-footed or too-crooked pastern are transmissible defects that should disqualify a stallion for receiving a license more readily than should the actual presence of a ringbone on the pastern of good conformation, because those defects are predisposing causes that he will transmit to his get, and will contribute very materially to the development of ringbone. On the other hand, the stallion possessing a good conformation at those points will transmit that quality, and unless his offspring meet with some extraneous cause it will never develop ringbone. Seventeen States, however, see in the blemish alone, without regard

to the conformation accompanying it, sufficient evidence of a future progenitor of ringboned foals and accordingly refuse him a license.

ROARING

What accurate knowledge do we possess that justifies us in placing roaring or whistling in the category of transmissible or heritable diseases? Is the paralysis producing it not 90 per cent the sequel of the common inflammatory respiratory diseases? Do we not observe it among the progeny of all stallions with almost identical frequency? True, I grant you, it is most commonly found existing in the short, thick-necked, narrow-jawed animal, yet no conformation can be declared exempt from it. A stallion remains sound for many years, when he suddenly becomes a confirmed roarer; yet I believe that all will subscribe to the statement that of his foals begotten following that period no greater percentage will develop into roarers than will be found among those which he sired previous to the time of his becoming affected.

Then again, a stallion that roars may be entirely relieved of that condition by a successful laryngeal operation, and among all the laws of the different States, in not a single one of them is it possible to disqualify him, even though it be positively known that he has been surgically relieved. The act of roaring is itself the condemning feature without reference to the diseased organ that produces the offending noise.

If heredity plays an important part in the production of this unsoundness, why should a large percentage of animals delay until long after maturity and then require some extraneous influence to cause its development? If it is heritable to the extent of being a menace to the breeding interests, why are not a greater percentage of our draft horses roarers, since 50 per cent or more of all draft stallions located in the Middle West that reach the age of 10 or more years are confirmed roarers, a ratio that has held good for more than 30 years?

To my mind, any State is doing the horse business a great injury when it disqualifies any desirable stallion on account of being a roarer, yet 15 States have legislated and banished him from their borders.

SIDEBONES

Stallions possessing sidebones are made unwelcome guests by 15 different States.

Traumatism or other extraneous influence may cause the develop-

ment of sidebone on the very best of conformations, yet all will agree, I believe, that the too-straight or too-crooked pastern and the narrow, contracted, or the too-flat foot are heritable defects that predispose toward its development. On the other hand, I believe that none will affirm that the stallion with a good conformation at that point, possessed of a sidebone caused by external traumatism, is necessarily destined to be the progenitor of a family in which sidebones predominate.

HEAVES

Heaves offends the stallion laws of 7 different States, and animals so affected cannot secure a license to stand for public service.

While any horse is subject to its ravages, the greater percentage of cases are found in those of a certain type and conformation, the compact, full-made animal, possessed of what we term a good middle and a ravenous appetite. They are always what we call good feeders, capable of withstanding hard usage and still retaining good flesh. In fact, in all classes of horses his is the type most sought, as it is considered the trade-mark of efficiency and the ideal conformation, whether in the show-ring, the markets, or on the turf.

It would seem a rational statement that the more heritable a disease the younger we might expect its appearance in the offspring of a stallion so tainted. Here is a pathological condition, declared heritable, but never occurring in other than matured horses; a disease that is entirely due to mismanagement on the part of the user or caretaker and one that is as easily prevented as it is produced. I fail to see how a fair-minded veterinarian can for a single moment condemn it as being of a heritable nature, and for us to stand idly by and permit a law to be enacted disqualifying a stallion solely because he is affected with "heaves" is a serious reflection on us and as unreasonable a procedure as were we to bar an extra heavy milking cow from the breeding or dairy herd simply because she had previously been affected with parturient paresis.

OTHER UNSOUNDNESSES

Proceeding briefly for lack of time, are chorea, stringhalt, crampiness, shivering and those allied conditions of such a heritable nature as to necessitate disqualifying an extra high-class stallion and leaving an inferior or common animal that happens to be sound as the only available stallion for patronage? Thirteen States, some of which are sadly lacking in good stallions, have said "yes," while a

majority of the best horse-producing States have passed them by as being of a negligible character.

Regardless of any transmissible feature, which it may or may not possess, is melanosis of sufficient importance that we should banish a good stallion so affected from the breeding ranks? Ten States, some of which are in need of good stallions, have declared that it is. Is navicular disease a hereditary trouble? Eight States undoubtedly believe so.

Can laminitis or canker of the foot be transmitted from parent to offspring? One State, apparently, does not care to assume the risk, while two States, as widely separated as space will permit, join in legislating against osteoporosis.

Thus we see widely diversified opinions recorded under the different laws regarding the transmissibility of these various blemishes and unsoundnesses. It is regretable that they are not more uniform in character at least, since it is not easily explained to the laity how an unsoundness can be transmissible in one State and not in another. However, I can see no hope for improvement under existing conditions, either as to producing a better class of horses or as to reducing the number of blemishes on future animals. In only 6 out of the 26 States is it possible to disqualify a stallion until he actually possesses an offending blemish. If that unsoundness is heritable, then he himself has beyond question possessed that taint since birth and has already transmitted that heritable taint to all offspring sired previously to his condemnation.

Doubtless there are those who do not concur in what I have said, and with you I have no quarrel. I do not desire to advocate and sanction the licensing of all sorts of stallions afflicted with all sorts of blemishes and unsoundnesses. From an administrative standpoint, if for no other reason, I know what would be the psychological effect upon the laity. There are unsound stallions so superior, however, that their disqualification is a calamity. There are literally thousands of sound stallions that should be refused a license. It is a deplorable fact that our present laws have eliminated from the breeding ranks many excellent stallions of the proper conformation, type and weight, stallions that even though possessed of a slight blemish which they might or might not transmit would still be a positive benefit to the community; and have left in their place, simply because he was not unsound, as the only available animal for service, an inferior, common, no-account

"stud-horse" that should never have been born in the first place, much less permitted to exercise the privileges of a sire. In many communities, therefore, these laws have been the means of a step backward in the horse business instead of an aid to progress.

Stallion laws should be enacted with but one object in view—the production of a better race of horses. The premises on which our present laws are based are fundamentally wrong. They are founded entirely on the hypothesis that certain blemishes and unsoundnesses are transmissible from parent to offspring, but inferentially one gathers that the anomalies inviting such unsoundness are not heritable. The reverse of this is true. The direct transmission of any disease from parent to offspring is unproved. The weak conformations, the faulty defects, the atonic weaknesses that invite and predispose the animal to the development of such blemishes, are the taint that is transmitted with unfailing constancy, and any law that takes into consideration the blemish without duly reckoning with the structural weaknesses as the predisposing cause of that blemish will increase rather than diminish unsoundness in the generations of equines that are to come.

The transmission of these various blemishes by stallions possessed of a good conformation at point of blemish is of a negligible character as compared with those whose conformation is weak and faulty, even though the latter must technically be passed as sound. Blemishes and unsoundnesses are not extensively found among the progeny of blemished sires, unless there be also present a transmissible faulty conformation. Many stallions whose names are household words have been thus severely handicapped in the extent of their services and have lived long enough to demonstrate to the world that they did not transmit their unsoundness. Had Wisconsin possessed her stallion law 30 years ago, Pilot Medium, with his two large bone spavins, would have been disqualified and we should never have heard of Peter the Great or any other of his illustrious descendants that have made more turf history in the past 15 years than any other family. Had California possessed her law, the get of the notorious roarer Ormonde would never have faced a starter. Had Kentucky enacted such a law 50 years ago her blue-grass regions would have been less famous, for she would have lost, aye, this nation would have lost, perhaps the most celebrated sire ever within our borders, old Lexington, blind with periodic ophthalmia from a 4-year-old. International prize-winners have been bred from sire and dam both of whom were blemished. Case on case, of sire

after sire, might be cited, whose get have made history in the showring and on the turf, who today could not return and stand for public service in the States that they helped make famous.

We need a law founded on type, conformation and individuality as well as unsoundness; a law that will call attention and give praise to a particularly high-class stallion, and at the same time disqualify the common and inferior animal even though he be sound; a law that will plainly state if an animal is sound, and if not sound will explicitly state of what unsoundness he is possessed and as to whether or not it may reasonably be considered transmissible. Coupled with this, we need an official examiner or an examining board in each State, who will fearlessly do their duty. The placing of this duty in the hands of the local veterinarian has proved neither to the best interests of the law nor of the veterinarian, and he will gladly welcome the change.

But you ask, "Is it possible to frame a law that will do justice to all concerned with the ultimate result of producing a better and a sounder race of horses?" I believe that it is. Two years ago, as chairman of a committee appointed for the purpose, I presented the subject before the Illinois State Veterinary Medical Association, advocating an examining board in each county who should judge stallions by a score-card, those capable of scoring 90 or more points to be licensed as "State approved stallions," and those falling below 65 points to be refused a license. Since that time, however, I have come into possession of the stallion registration law of Saskatchewan, which is so complete and along the same lines that I feel that with a few changes it could be profitably adopted by our States. Briefly, it provides for the grading of stallions by an official examiner into classes A, B, C and D, according to their individual merits.

Class A is as follows: "Said stallion has been examined by official examiner and found to be up to standard of conformation, type and quality desirable for stud service, free from any unsoundness due to defective conformation, or structural weaknesses, and is highly recommended for breeding service in any part of Saskatchewan."

Class B is stated to be of fair conformation and free from hereditary unsoundness.

Class C is unsound and such unsoundness is noted in body of license.

Class D refers to grades.

I earnestly commend this law for your investigation.

Veterinarians are today doing a noble work along the lines of

sanitation, the conservation of health and the saving of life and usefulness of all species of the animal kingdom, but no phase of their highly specialized and scientific work is of more importance at this time than their aid in the production of a better and a sounder class of horses.

The unprecedentedly rapid increase in land values forever forbids the future production of the common or inferior horse except at a financial loss. Grain rations can never again reach the low level of prices scheduled during the nineties. The $300 to $500 animal must be our aim if we are to continue remunerative horse production.

Fully 50 per cent of our stallions today should be unsexed and not permitted to perpetuate their miserable defects and faulty conformations on future generations. We have three times as many stallions as we really need. We really need three times better ones. We must advocate the doctrine of more stallion castration and less stallion registration. Added to this we need a State or Federal subsidy for our best stallions, so that our better individuals of correct type and conformation may be preserved to the breeding industry and placed in communities where they may do the most good. Then when we shall have educated the farmer to the fact that the dam who for 11 months carries the foal, and whose blood nourishes every atom in its anatomy, should share one-half of the responsibility in the production of an ill-shaped offspring; when, because of their inferiority, we shall have eliminated from our breeding ranks fully 50 per cent of our mares, and a like percentage of our stallions, then will we indeed have been instrumental in the production of a better race of horses, and the real mission of a stallion registration law have been accomplished.

Dr. George M. Potter, formerly in the Pathological Division of the Bureau of Animal Industry in Washington, D. C., and later in charge of educational hog cholera work for the Bureau in Kansas, is now conducting a veterinary practice in Hammond, La., where we understand the doctor is doing well. With the exception of about one year, Dr. Potter had been with the Bureau since 1906.

Dr. H. L. Duell, who entered the service of the Bureau of Animal Industry in April, 1911, and who was assigned to hog cholera control work in 1914, resigned his position February 29, 1920.

THE BACTERIOLOGY OF THE REPRODUCTIVE ORGANS OF THE COW AND ITS RELATION TO THAT OF THE MECONIUM OF THE CALF[1]

By WARD GILTNER *and* S. G. BANDEEN

East Lansing, Mich.

IN the past, efforts to determine the specific microbic etiological factor of a number of diseases have been rendered futile, at least for an uncomfortable period, because of the ignorance of the bacteriologist of the normal variations in the microflora of the several regions of the animal body. *Bacillus icteroides* of yellow fever, *B. cholerae suis* of hog cholera, bipolar staining bacteria, pneumonia-like diplococci, buccal amebae and many others have led investigators down blind alleys. Even in bovine infectious abortion Evans has reported abortion-like bacteria in the milk, a fact which well might annoy the unwary investigator. A complete knowledge of the microflora of the bovine reproductive organs seems to us essential to a full understanding of the problems involved in a study of the diseases involving those organs.

For the past ten years we have concerned ourselves with this problem, without, however, exhausting its possibilities. Others have also seen the importance of such studies. Considering the udder in its proper light as one of the reproductive organs, we have directed studies of its flora from the standpoint of abortion disease. The results in so far as apparently normal cattle are concerned may be summarized as follows:

1. The normal bacterial flora of the udder is comprised of microflora belonging largely to two types, the micrococci and the staphylococci, varying in pigment production, fermentation reactions, hemolytic power, and to other tests to which they have been subjected.

2. The comparison of the organisms isolated from the udder with those isolated from the primary genital organs reveals no close similarity.

Therefore we are not led to believe that ordinarily there is a migration of organism from the primary genital organs to the udder or vice versa, but it is urged that more work be done along this line.

Extensive studies on the bacterial flora of the uterus and vagina

[1] Paper presented at the Fifty-Sixth Annual Meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

of cattle have been made in our laboratory. In one series of 30 cattle (abortion disease present), swabs were made from the vaginas of 30 and from the uteri of 23. Thirty-four organisms were isolated from the vaginas and 24 from the uteri. There were 52 different organisms isolated, only 5 of which occurred in both uterus and vagina. There were no two cows which showed an identical flora in either uterus or vagina, and there was very little similarity in the bacterial flora of any two cows, although they were all on the same premises. Swabs were made from the sheaths of several bulls, and of the 20 organisms isolated all but 1 were also found in the uterus and vagina of cows. There is, thus, evidence that there is a general relationship between the flora of the generative mucosæ of the two sexes.

Of the organisms found there were, of the four genera according to Migula: Bacterium, 22; Bacillus, 3; Micrococcus, 11; Streptococcus, 4. In the course of the work it was found that many of the bacteria required a neutral medium and could not grow on a medium at all acid to phenolphthalein.

Mohler and Traum studied the flora of the vaginas of 9 cattle. The abortion bacillus was not found. The most frequently observed organisms included *Bacillus coli, B. subtilis, Streptococcus pyogenes albus, S. pyogenes bovis, Pseudomonas pyocyanea, Bacillus mesentericus, B. vulgaris, Cladothrix nonliquefaciens,* and *Sarcina subflava,* with a much larger number of undetermined species. They state that while there was a certain uniformity in the species found, there were many types that were transient, the result of contamination through the vulva, and all were not present in every case.

The bacterial flora of the bovine reproductive organs under abnormal conditions centers about abortion disease. Little is to be gained by a review of the literature prior to the general acceptance of Bang's efforts to incriminate *Bacterium abortus* as the etiologic factor in epizootic abortion. In outbreaks of abortion Bang's bacillus is generally found in the pregnant uterus, fetal membranes, fetus, and in the udder.

Schroeder and Cotton injected cultures of the abortion bacillus into non-pregnant uteri of cows and found that the organisms disappeared in a few days. This corresponds with our experience. In fact, we have failed to isolate the abortion bacillus when introduced into the vagina or sheath generally after 24 hours. An examination of the uterine discharges of aborting cows by Schroeder and Cotton shows that the abortion bacillus disappears after two or three weeks,

the maximum being 51 days. The same investigators and also Cooledge have noted the persistence of *Bacterium abortus* in the udder quite indefinitely after it becomes established.

Stockman and Theobald Smith and Buck and Creech, as reported by Cotton, have found spirilla or vibrios (*Vibrio fetus*, Smith) in the uterine exudate presumably standing in etiologic relation to abortion. Good reports finding *Staphylococcus pyogenes aureus* in the uterus as well as fetal membranes and fetus of an aborting cow. Moussu and others are of the opinion that certain strains of colon organisms will cause abortion. Uterine tuberculosis is noted by McFadyean and Stockman and by Williams. Egglink, reported by Ward, records a bacteriological investigation of 20 cases of endometritis with the following results: Tubercle bacilli, 2; *Bacillus pyogenes*, 14; streptococcus, 12; colon bacillus, 6; staphylococcus, 5; *Bacillus proteus*, 3; *B. subtilis*, 1.

In 11 cases reported by Wall there occurred: Streptococcus, 7; colon bacillus, 5; *Bacillus pyogenes*, 3; anaerobic bacillus (in one of these bacillus of malignant edema), 2; necrosis bacillus, 1; proteus bacillus, 1.

Cystic ovaries have been studied bacteriologically to a limited extent. Fitch reports that one ovary gave a pure culture of a long chain streptococcus. *Bacillus coli* was found in several and *Micrococcus pyogenes* was found twice. We have failed to find the abortion bacillus or its antibodies in ovarian cystic fluids.

The work of Hagan shows that there is a relation between the organisms found in the utero-chorionic space and those found in the amniotic fluid and the meconium. In 16 pregnant cows the utero-chorionic space gave cultures in 14 cases or 87 per cent; the fetal fluids gave cultures in 5 cases or 33 per cent, and in 4 of the 5 cases the cultures corresponded. Hagan studied the meconium in 2 herds. The meconia from 6 calves in 1 herd were all sterile. In the second herd 3 were sterile while the other 5 gave growths as follows: Three were colon bacilli, 1 was streptococcus and 1 was mixed streptococcus and staphylococcus.

Schroeder and Cotton have found that aborted fetuses harbor Bang's bacillus in the stomach, liver, intestine, lymph glands, spleen and blood, and that in all cases in which the fetus was infected the organism was found in the utero-chorionic space. In our laboratory Huddleson examined 9 aborted fetuses. *Bacterium abortus* was isolated from the stomach contents of 8. In only one instance was the organism isolated from the fetal blood, spleen, kidney and

liver. Williams states that Bang's bacillus is frequently found in the stomach and blood or glands of the fetus but never in the rest of the alimentary tract. This indicates to him that the primary fetal invasion is through the chorion into the amniotic fluid. Smith found his *Vibrio fetus* alone and with other organisms (colon, *Bacterium abortus*, *Bacillus pyogenes*, etc.) in the fourth stomach, rectum, lung, spleen, liver and kidneys of fetuses.

The work which we wish to report on at this time in more detail had as its purpose the determination of the relation between the bacterial infections of the uterus and the flora of the alimentary tube of the fetus and the persistence of the abortion bacillus in the uterus subsequent to abortion and parturition. This work was done largely by Dr. Bandeen with the advice and assistance of Drs. Hallman and Stafseth.

METHOD OF INVESTIGATION

Immediately after abortion or apparently normal parturition (cases in which the calf lived) the buttocks and tail of the calf were thoroughly washed with mecurial soap and water. A sterile rubber glove was then put on the hand, and by means of the first finger inserted into the rectum a small amount of meconium was obtained for bacteriological examination. If the fetus was dead at the time of abortion, or died in a few minutes afterwards, it was taken to the laboratory where the meconium could be obtained under strictly aseptic conditions. At the laboratory the fetus was opened to expose the stomach and intestines, then a red-hot spatula was held on an area of the stomach as well as on a part of the colon to be opened. A sharp scalpel that had been previously boiled in water was used to open the stomach. A different scalpel was used for the opening of the colon. The material was taken from the stomach by a sterile 10 c.c. pipette which was forced through the small opening made by the scalpel. The meconium was taken from the colon by a small spatula. Material from each was placed in a sterile Esmarch dish.

Material was collected from the uterus of the cow within a few hours after abortion or apparently normal parturition, also on the following day, and then once each week for several weeks. The buttocks, tail and vulva of the cow were thoroughly washed with mecurial soap and water. The vagina was washed out with plenty of physiological salt solution. The uterus was retracted with uterine retractors, and if in any case the cervical canal was closed or too

small for the metal catheter it was first dilated with a pair of uterine dilators. The introduction of a pair of dilators into the cervical canal should be done with great caution, as the congested mucosa is easily perforated. After dilation of the cervical canal a metal catheter was introduced into the uterine cavity. The catheter cannot be introduced to any considerable distance unless the end is turned to one side or the other, as the body of the uterus is comparatively short. If the catheter is inserted straight in, it will come in contact with the anterior wall separating the right and left horn.

The catheter was then connected with a force pump by means of a rubber tube and the sterile physiological salt solution pumped into the uterus. A return flow catheter was not used in this work. It was necessary to compress the rubber tube and hold the solution in the uterine cavity until the uterus was well massaged per rectum. When the uterus was well massaged the rubber tube was removed from the catheter and a small amount of the solution allowed to escape. A sterile flask was used to catch the remainder, which was taken to the laboratory.

In bad cases of pyometra, with abundance of pus, it was not necessary to use the physiological salt solution except for flushing the uterus as a therapeutic measure. Simply massaging the uterus per rectum sufficed to force out through the catheter a large quantity of pus, which was collected in a flask for the examination.

The results of the investigation are well shown in the tables, which are arranged to compare in parallel columns the micro-organisms found in the uterus of the dam with those found in the meconium and elsewhere in the fetus. It will be noted that in the case of the uterine examinations cultures were made successively over a considerable period of time or until it was difficult to explore the uterus, while in the case of the fetus only one examination was made.

In every case where guinea pigs were inoculated with uterine washings and with material from the fetus, negative results were secured from both macroscopic and microscopic autopsy examinations and from serological tests so far as *Bacterium abortus* is concerned.

RECORD OF EXPERIMENTS

Case 995 was purchased in 1913 at age of 1 year; blood test negative, August, 1913. November, 1913, received 10 c.c. culture of dead *Bacterium abortus*, also similar injections in December, 1913, January and February, 1914. May, 1914, serum reaction positive. In November, 1916, and December, 1916, she was given

5 c.c. and 10 c.c. respectively of dead culture of *Bacterium abortus*. February, 1917, she was given 20 c.c. of live culture of *Bacterium abortus*. All injections were subcutaneous. Serum reactions have been positive since February, 1917. Calved January, 1916. Bred again October, 1917, and aborted on the 249th day of gestation, June 24, 1918, following which a uterine infection developed. Cultures were made at this time. She was bred in July, 1918, and killed in January, 1919, for beef. She was pregnant in the left uterine horn. No organisms could be grown from the uterochorionic space, amniotic fluid and meconium.

Case 995-B, the calf of 995, born alive but very weak.

Case 801 was purchased September, 1917; blood reaction negative. Bred November, 1917, and at week intervals beginning May, 1918, she received intravenously four injections of 5, 10, 20 and 20 c.c. respectively of live culture of *Bacterium abortus*. One week after the first injection she developed strong serum reactions to *Bacterium abortus*. She aborted July 17, 1918, the 257th day of gestation. Placentæ removed the following day, and the uterus flushed with an antiseptic solution.

Case 801-A, aborted fetus of 801, lived only about one hour.

Case 802 was purchased September, 1917; blood reactions negative throughout. Bred September 21, 1917, and calved June 27, 1918. She developed a uterine infection after parturition, the discharge being bloody.

Case 802-A was the strong, healthy calf of 802.

Case B. S., a Brown Swiss cow in a near-by herd, aborted July 5, 1918, on the 200th day of gestation.

Case B. S. A. was the aborted fetus of B. S.

Case 805 was purchased September, 1917; blood reaction negative. Bred November 3, 1917. At week intervals beginning May 29, 1918, she received subcutaneously 10, 20, 40 and 40 c.c. respectively of live culture of *Bacterium abortus*. By June 21 she developed a marked reaction to the serum tests persisting to date. She calved August 7, 1918, cleaned well, but developed a bad case of endometritis. *Bacterium abortus* persisted in the uterus for 28 days after parturition. She aborted an 8-month calf in May, 1919. *Bacterium abortus* found in exudate and milk.

Case 805-A was the strong and apparently healthy calf of 805.

Case 997-B was born February, 1916; blood negative to serum tests throughout. January 16, 1917, she received 25 c.c. of live culture of *Bacterium abortus;* also October 12 and again October 13, 1918, she received 5 c.c. of live culture on her feed. She calved November 15, 1918.

Case 997-B1 was the strong, healthy calf of 997-B.

Case 999 was purchased at the age of 1 year; blood reactions negative. October 10 and again November 8, 1913, she received 10 c.c. of live culture of *Bacterium abortus* subcutaneously, developing serum reactions October 29. She calved February 3, 1916. December 13, 1916, she received 10 c.c. of live culture *Bacterium abortus* intravenously, and reacted positively January 5, 1917. She calved November 5, 1917; was bred February 15, 1918, and calved November 26, 1918, cleaning normally.

Case 999-D was the strong healthy calf of 999, born November 26, 1918.

Case 806 was purchased September 7, 1917; negative to serum reactions. September 25, 1917, she received intravenously 10 c.c. of a killed culture of *Bacterium abortus* and October 5, 1917, she received 30 c.c. of live culture of *Bacterium abortus* and developed a full, positive reaction to the serum tests. This cow had failed to come in heat and had been given an electric dissociation treatment by Dr. Hallman. She was given live cultures of *Bacterium abortus* on her feed every day for one week beginning February 22, 1918. She was bred February 27 and calved November 25, 1918. Two days later there was a discharge of pus from the uterus.

Case 806-A was the calf of 806.

Case 11-A1-A was purchased January, 1917, at the age of 2 years, at which time the blood reaction was negative. She aborted her first calf January, 1917, and a year later gave birth to an apparently healthy calf. January 13, 1919, she calved normally again, cleaning within a few hours. Two weeks later there appeared a dirty yellowish discharge from the uterus.

Case 11-A1-A2 was the apparently normal calf of 11-A1-A, born January 13, 1919..

Case 999-A, born February 3, 1916, gave negative serum reactions throughout. She calved January 23, 1918, and again December 24, 1918. She cleaned in about 2 hours but developed a metritis.

Case 999-B was the apparently normal calf of 999-A, born December 24, 1918.

Case 807, purchased September 7, 1917, gave negative blood reactions. September 13, 1917, she was given 10 c.c. of a culture of killed *Bacterium abortus* subcutaneously. She developed a positive reaction September 20, 1917, lasting till November 16, 1917, since which time her reactions have been negative to the serum tests. September 23, 1917, she was given 25 c.c. of a culture of live *Bacterium abortus* subcutaneously. Since she did not come in heat she was given an electric dissociation treatment by Dr. Hallman January

2, 1918. April 2, 1918, she received 5 c.c. of a culture of live *Bacterium abortus* intravaginally and was immediately bred but failed to conceive. She was given the same treatment April 22, May 31 and June 9, 1918, and on June 10 she conceived. Beginning November 20, 1918, she discharged shreds of tissue and a dirty, yellowish, putrid pus. This continued until December 27, 1918, when she aborted. The placentæ came away in small pieces mixed with pus as described.

A streptococcus isolated from this case six different times failed to grow the first 2 days of incubation. On the third day of growth in the Novy jar the colonies appeared as small, bluish pin-points. One cubic centimeter of a suspension of this culture injected subcutaneously into a pregnant guinea pig produced abortion in 3 days. One day later the guinea pig was autopsied. The spleen was once and a half its normal size. The streptococcus was isolated from the spleen, blood and uterus.

Case 807-A, the fetus of 807, was aborted on the 200th day of gestation. A streptococcus similar to that isolated from 807 was found in the blood, liver, spleen, stomach and meconium of the fetus. The liver and spleen of the fetus were very friable.

Case 997 was purchased at the age of 1 year. October 10 and again November 8, 1913, she received 10 c.c. of a live culture of *Bacterium abortus*. She developed a positive reaction to the abortion tests which was maintained until May 29, 1914. She calved February 4, 1916. December 18, 1916, she received 10 c.c. of a live culture of *Bacterium abortus*, after which she developed a positive reaction to the serum tests and maintained it. She calved December 21, 1916, and again January 18, 1919.

Case 997-C was the apparently strong and healthy calf of 997, born January 18, 1919.

TABLES.

A Comparison of Organisms from the Meconium and the Uterus.

Date	Case 995, Uterus	Case 995-B, Meconium
6–24–18	Bacillus subtilis B. coli communior Staph. pyogenes aureus	B. coli communior Staph. pyogenes aureus
6–28–18	Staph. pyogenes aureus B. coli communior	
7–3–18	Staph. pyogenes aureus Staph. pyogenes bovis Streptococcus pyogenes	
7–8–18	Staph. pyogenes bovis Streptococcus pyogenes	
7–12–18	B. 121.2421032	
7–17–18	No growth	

Date	Case 802, Uterus	Case 802-A, Meconium
6–27–18	Staph. pyogenes aureus Streptococcus pyogenes	Staph. pyogenes bovis B. coli communior
7–3–18	Staph. pyogenes bovis B. coli communior	
7–11–18	Staph. pyogenes bovis B. coli communior	
7–18–18	Cervix was perforated	

Date	Case B. S., Uterus	Case B. S. A., Meconium
7–5–18	B. coli communior B. coli (Sub-group I) Bact. 212.2442014 Bact. 111.2421014 Bact. 122.1111032 Bact. 222.2121012	Staph. pyogenes aureus B. coli (Sub-group II) B. coli communior Bact. 212.2441014 Heart blood, B. coli communior Stomach, no growth

Date	Case 801, Uterus	Case 801-A Meconium
7–17–18	Bact. abortus Streptococcus pyogenes Staph. pyogenes bovis B. coli communior	Staph. pyogenes bovis stomach, no growth
7–20–18	Bact. abortus Streptococcus pyogenes Staph. pyogenes bovis B. coli communior	
7–26–18	Staph. pyogenes bovis Streptococcus pyogenes	
8–1–18	B. subtilis Staph. pyogenes bovis Bact. abortus	
8–14–18	Staph. pyogenes bovis Streptococcus pyogenes Bact. 1224222034	
8–21–18	Streptococcus pyogenes	
8–28–18	No growth	

Date	Case 805, Uterus	Case 805-A Meconium
	Bact. abortus	Staph. pyogenes aureus B. coli communior
8–9–18	Bact. abortus	
8–15–18	B. pyogenes Bact. abortus	
8–23–18	Staph. pyogenes albus Streptococcus (Gram.) Bact. abortus	
8–30–18	Streptococcus pyogenes Staph. pyogenes bovis Bact. abortus	
9–4–18	Streptococcus pyogenes Bact. abortus	
9–11–18	Streptococcus pyogenes	
9–18–18	No growth	

Date	Case 997-B, Uterus	Case 997-B1, Meconium
11–15–18	Amniotic fluid, no growth	No growth
11–27–18	No growth	
11 –5–18	No growth	
12–12–18	No growth	

Date	Case 606, Uterus	Case 806-A, Meconium
11–25–18	B. coli communior	B. coli communior
11–27–18	B. coli communior Streptococcus pyogenes	
12 –5–18	B. coli communior Streptococcus pyogenes	
12–10–18	B. coli communior Streptococcus pyogenes	
12–17–18	Streptococcus pyogenes	
12–22–18	Cervix closed	

Date	Case 999, Uterus	Case 999-D, Meconium
11–26–18	Staph. pyogenes aureus	Staph. pyogenes aureus
11–30–18	Staph. pyogenes aureus	
12– 6–18	No growth	

Date	Case 999-A, Uterus	Case 999-B, Meconium
12–24–18	B. coli communior	B. coli communior
12–31–18	B. coli communior	
1–7–19	Streptococcus	
1–14–19	No growth	
1–21–19	Streptococcus	
1–28–19	No growth	

Date	Case 807, Uterus	Case 807-A, Meconium
12–27–18	Streptococcus B. coli communior	Streptococcus (Streptococcus in liver, spleen, blood and stomach)
12–28–18	Streptococcus B. coli communior	
12–31–18	Streptococcus B. coli communior	
1–7–19	Streptococcus	
1–14–19	Streptococcus	
1–21–19	Streptococcus	
1–29–19	No growth	
2–5–19	No growth	

Date	Case 11-A1-A, Uterus	Case 11-A1-A2, Meconium
1–13–19	No growth	No growth
1–14–19	No growth	
1–21–19	No growth	
1–29–19	Streptococcus pyogenes	
2–5–19	Streptococcus pyogenes	
2–12–19	No growth	

Date	Case 997, Uterus	Case 997-C, Meconium
1–18–19	No growth	No growth
1–21–19	No growth	
1–28–19	No growth	

SUMMARY AND CONCLUSIONS

In this series of 12 pairs of cases of fetus and dam, bacteria were isolated from the uterus in 11 cases and from the meconium in 9 cases.

Since the flora of the digestive tube of the fetus or living calf necessarily changes very soon after the end of intrauterine life, nothing was to be gained by making more than the initial examination of the meconium. As a result of the initial examination of the meconium and the uterus there were 3 of the 12 pairs of cases (uterus and meconium) that gave negative results (997-B, 11-A1-A, 997).

Bacillus coli communior and *Staphylococcus pyogenes aureus* were found in only one pair of cases (995).

Bacillus coli communior was found in three other pairs of cases (B.S., 806, 999-A), making its total appearances in 5 of the 12 pairs of cases or in 6 out of 9 cases of the meconium and 5 out of 11 cases of the uterus that showed any organisms at all.

Staphylococcus pyogenes aureus was found in a total of 3 uteri and in 4 meconia.

Staphylococcus pyogenes bovis was found in 2 pairs of cases (802-A and 801) and in a total of 4 uteri and in 2 meconia.

The only other organism significant by its appearance in both uterus and meconium was a streptococcus (807) of high virulence, except that in the pair of cases B. S. and B. S. A. there may have been an identity of a colon organism and a bacterium.

We are therefore inclined to believe that *Bacillus coli communior*, *Staphylococcus pyogenes aureus* and *Staphylococcus pyogenes bovis*

are very likely to occur in the uterus as well as in the digestive tube of the calf in cases of metritis.

Dr. Stafseth has found similar organisms in the deeper layers of the mucosæ in cases of metritis and has not found *Bacterium abortus* in the deeper layers. The significance of his findings will be discussed in detail in papers by himself and by Dr. Hallman.

Bacterium abortus was found only once in the uterus and in no case in meconium.

The significance of the presence or absence of *Bacterium abortus* in such cases as are included in this paper with special reference to the history of the cow as regards treatment with live cultures and previous abortions and serum reactions will be considered at another time. Attention is directed, however, to a study of the case reports recorded herein for suggestions in this connection.

OKLAHOMA NOTES

Drs. W. P. Shuler and H. W. Ayres, Deputy State Veterinarians, resigned February 5. Dr. Ayres and Dr. C. H. Hooker have opened an office in Oklahoma City and Dr. Shuler has accepted a lucrative position with an oil company in Texas.

Drs. C. O. Booth, of Oklahoma City, and S. P. Regan, of Wellsville, N. Y., have been appointed to fill the vacancies on the State force.

Dr. Daniel M. Purdy, of Salina, Kan., has recently been appointed as a veterinary inspector on the meat inspection force at Oklahoma City.

Dr. Robert McCauley, of Chicago, has again entered the service of the Eagle Company at Oklahoma City.

A prominent swine breeder from the western part of the State recently secured a verdict of $3,000 against a local serum company. It was claimed that the serum treatment caused a sickness in the plaintiff's stock and a suit for damages resulted. Our understanding is that the court instructed the jury to find for the defendant if it was proven that the serum was produced under Federal supervision and properly administered. However, the jury appears to have disregarded instructions and found for the plaintiff. The district judge on reviewing the case on the 12th instant set the verdict aside. This will probably have a tendency to curb the increasing amount of litigation against serum companies.

J. S. GROVE.

SWINE OBSTETRICS[1]

By E. R. TILLISCH, *Westbrook, Minn.*

SWINE obstetrics, in its most restricted sense, is a consideration of the necessary or advisable oversight or aid during the act of parturition. The subject is one of intense scientific and economic importance as it lies at the very foundation which largely determines the ultimate success or failure of this great swine industry.

To take charge of swine obstetrics successfully we must know the anatomy of all those organs having a vital relation to the act of reproduction either directly or indirectly, a study of the physiologic functions of the reproductive organs, also the pathology of breeding and the pathology of pregnancy. And in order to succeed the veterinarian must be judiciously equipped, not only from the standpoint of quantity and quality, but also in reference to the readiness of his equipment for immediate use. The equipment should be carefully selected and arranged and should include every article which is likely to be needed during the operation, and should be carefully packed in a container ready for immediate transportation, so that no article of importance will be left behind or forgotten.

The instruments I use are ample in number, simple in character, but efficient for any operation or manipulation which I may be called upon to perform.

The contents of my obstetric outfit for swine are as follows: A bottle of pituitary extract, two or three ordinary pig forceps, a hook, some soft copper wire, a razor, two scalpels, three or four dressing forceps, one needle forceps, needles for suturing, suture consisting of cat gut, twisted silk, and some heavy twisted linen, several packages of sterile gauze, each piece being about one yard in size, a package of absorbent cotton, some drug for disinfection, antiseptic liquid soap, and a four-ounce bottle of tincture of iodine, several doses of quinine and urea hydrochloride, also some camphorated oil for a stimulant. Now for a call to a sow which is farrowing. First get the history as to the length of time sow in question has been sick. Has any one worked with her? Did she have any pigs? Were they born dead or alive? Ask your client for a basin of warm soft water, wash your hands in a clean disinfectant solution, lubricate them with vaseline, and examine the vagina to see whether it has been torn by any one that might have

[1] Presented at the Twenty-third Annual Meeting of the Minnesota State Veterinary Medical Association, St. Paul, Minn., January, 1920.

tried his ability. Should you find any parts torn, explain to the client that this may be the cause of death by infection already introduced in such a wound. And all practitioners will admit that a lot of sows will be sick for from one to three or four days before the veterinary surgeon is called in. Where the patient is found with a large swelling of the vulva and vagina, a high temperature, and the sides of the sow are extending and animal shows great pain on being handled, it would be well to explain conditions to the owner and have the animal destroyed. But provided you find that the sow has not been sick very long and the genital passage is in good condition, you may then feel for the fetus, and if it is up so it can be felt it is an easy matter to place a forceps against the head of the fetus and when labor lets up the fetus will naturally slide back a little. Follow it and at the same time open the jaws of the forceps so the head of the fetus will pass into same when the next labor pain takes place. Now that you have a firm hold, traction should be applied slowly and delivery will be brought about by the aid of the laboring of the sow. This one being delivered, leave the patient to rest for ten or fifteen minutes. By this time you will be able to feel another fetus provided labor is not exhausted, and in such a case pituitary extract should be given in a small dose which will stimulate labor. If the fetus is normal and alive it can be felt in the course of a few minutes, and the forceps can be used as above described. Should the fetus fail to move upward give a larger dose of pituitary extract, then wait fifteen to twenty-five minutes for results. If on examination there is no fetus to be felt it would be well to explain to the client that the Caesarian section would be the only and best way to save the life of the sow. Explain that while the sow may die after the operation, 70 per cent will recover.

The Caesarian section was resorted to in early days to save the fetus, but today the operation is performed to save both the fetus and the mother. Caesarian section is resorted to in the sow because embryotomy is impossible owing to the smallness of the pelvic canal. There are several reasons why a veterinarian should resort to the operation at an early stage. While you wait the sow loses all her vitality and the client gets disgusted. This is usually during the busiest season for the veterinarian and one cannot afford to spend all day or night with one sow; therefore, one had better perform the operation which will be outlined below.

The sow is placed on her left side which gives free access to the

right flank which is my favorite seat for operation. The sow does not need to be tied, but ask the client to place his knee against the sow's neck and hold the upper fore leg with one hand so she will not get up. The necessary equipment is included in the previously mentioned container. Wash the flank with liquid soap, shave the hair, then inject into several places in the flank with a hypodermic syringe two to four grains of quinine and urea hydrochloride, which comprises the necessary anesthesia for the operation. Then clean the flank again, paint it over with tincture of iodine, take a piece of the sterile gauze, cut an oblique hole about eight inches long in the center of it and place it over the sow with the opening directly over the seat for the incision. Then I ask the client to tighten his hold on the leg and I make a deep cut through the skin and fat tissue with a sharp scalpel. This cut which is about seven to eight inches long, begins at the external angle of the ileum, between it and the last rib. Then I separate the oblique muscles with the handle of my scalpel, following the grain of the tissue. This brings me to the peritoneal lining which I incise with the scalpel. Placing a finger on the membrane and with the scalpel placed alongside of the finger, a very slight thrust will force it through; the incision can be enlarged by means of a probe-pointed bistoury or it may be torn. It is more tedious to divide the muscles along the grain and somewhat inconvenient, but I prefer that to a clean cut as the muscle tissue will prevent the viscera from floating out. The incision through the peritoneal lining being made, I disinfect my hand well and then reach in and grasp the uterus about five or six inches from the bifurcation. This part is brought out through the opening, usually by grasping one of the pigs inside of the uterus. I then make an incision about 5 or 6 inches long cutting against the fetus which is in the loop of the uterus. I then pull out this fetus and remove all the remaining through the same incision by working my hand into the uterus. All fetuses and placental membrane being removed, clean the wound in the uterus, wipe the edges with a piece of gauze dipped in tincture of iodine and suture with cat gut; a running suture will do. The uterus being replaced, suture the peritoneal lining with cat gut the same as the uterus. The muscles will close automatically. Wipe the wound with a gauze dipped in tincture of iodine, then sew the skin with strong Irish linen dipped in tincture of iodine. This completed, instruct the owner to apply a little tincture of iodine solution to the wound once or twice daily. Keep the patient in a clean dry place and feed with a light laxative diet.

THE VETERINARY CORPS OF THE AMERICAN EXPEDITIONARY FORCES[1]

By LIEUTENANT-COLONEL H. E. BEMIS

Ames, Iowa

IN the preparation of this paper no attempt has been made to write a complete history of the Veterinary Corps of the A. E. F., nor to recite the hardships or accomplishments of the individual. The first would be impossible in the length of time allotted, and the second is of no consequence when considering the Corps as a whole. An attempt has been made rather to write a running account of the development of the Corps, giving the conditions under which it operated in its various stages and the results accomplished in each, with the hope of drawing conclusions which may be of some use in the future, and to offer some encouragement to the members of the profession as a whole.

I have written the story in two parts, corresponding to the two distinct types of administration. The first extends from the beginning of the A. E. F. to September 1, 1918, and the second extends from the latter date to the end of operations nearly a year later. The two periods are about equal in length.

FIRST PERIOD

Organization of Personnel

The early part of this period was the formative period for all departments of the A. E. F. There was little to guide the General Staff in the formation of the Veterinary Corps except the Act of Congress of June 6, 1916, which placed the Corps under the direction of the Surgeon General.

Evidently the General Staff quite soon gave some thought to the need of a veterinary service, but it apparently had little conception of what was being done in the Allied armies or of what would eventually be necessary for the successful operation of the Corps. In fact it seemed to have little conception of a veterinary service operating as a corps. This became apparent through the appearance of General Orders No. 39 and 42, issued the latter part of September, 1917.

G. O. No. 39 provided for the organization of mobile and sta-

[1] Paper presented at the Fifty-sixth Annual Meeting of the American Veterinary Medical Association, New Orleans, La., November, 1919.

tionary veterinary hospitals which were to be attached to the Remount Service. It authorized the organization of one remount depot and one mobile veterinary hospital for each corps and one for each army, and also authorized the organization of advanced veterinary hospitals attached to advanced remount depots, one per army, capacity of 1,000 animals, in the advanced section of the L. of C.; intermediate veterinary hospitals attached to intermediate remount depots in the intermediate section, and base hospitals attached to base remount depots in the base section.

G. O. No. 42 authorized one private, first class, or private, Medical Department, as assistant with each veterinary surgeon, and one sergeant, Medical Department, for duty with the principal veterinary surgeon of each regiment of cavalry and field artillery, in addition to the private. This order also specified that when animals were treated in the regiment, details would be made by the proper commanding officer from troops, batteries or quartermaster corps to care for those animals and to attend to the general policing of the stables.

These two General Orders provided a curious combination in which medical personnel operated under the control of the Quartermaster Department. No definite organization was possible other than to provide some veterinary personnel wherever sick animals happened to be found, after the plan used by the Regular Army in peace times. While there was provision for hospitals, there was no provision for evacuating units and no way of coördinating the work of the various organizations of the corps.

During August, 1917, thirty or forty young reserve officers, Veterinary Corps, arrived in France. Most of these had had no military experience of any kind, some of them barely having had time to purchase their uniforms in New York before embarking. They were sent chiefly to French hospitals for a period of training. As the number of American animals at this time was very small and sickness had not developed to any extent, there was little actual work to be done, and the A. E. F. had not yet learned the meaning of prevention.

The first animals were acquired by the American forces about July 4, 1917, from the British, French and Spanish. The number had reached approximately 15,000 by November 1, 1917.

On October 20, 1917, Major Louis A. Klein and Major A. L. Mason, Veterinary Corps, were ordered to France to report to the

Commanding General, A. E. F., per G. O. No. 108, for temporary duty and consultation in connection with organizing, equipping and supplying the Veterinary Department of the Expeditionary Forces. Upon arrival in France they received instructions from General Headquarters to report to the commanding officer of Medical Supply Depot No. 2, who in turn referred them to Major R. H. Power, Veterinary Corps, in charge of the veterinary section of the depot. Having completed their observations at the supply depot, they requested authority to proceed to Headquarters, L. of C., to consult with the Chief Surgeon, L. of C., but before receiving such authority they were summoned to Headquarters, L. of C., for temporary duty to consult with the remount officer.

The Chief Remount Officer had just been on a tour of observation of the British Army. What he had seen of their veterinary service had convinced him that the veterinary organization provided for in G. O. Nos. 39 and 42 was not sufficient for the A. E. F. When the plan of organization recommended by the Surgeon General was outlined to him by Major Klein he expressed the opinion that with the corps and army mobile veterinary hospitals added it would meet the conditions of the A. E. F. admirably, and suggested that the proposed tables of organization be revised to include these two organizations. On December 14, 1917, an order was received directing Majors Klein and Mason to proceed to Headquarters and report to the Chief Surgeon, A. E. F. They were at once received by the Chief Surgeon, who was very anxious that the veterinary service of the A. E. F. be properly organized, and arranged for a conference the next morning.

At this conference the plans for the organization of the veterinary service which had been prepared in the office of the Surgeon General were presented to him, together with a copy of the regulations which were intended to govern the operation of the Veterinary Corps. At the request of the Chief Surgeon a memorandum was prepared and presented on December 27. It described briefly the service which could be rendered to the A. E. F. by the Veterinary Corps, specified the personnel authorized by G. O. No. 120, paragraph 3, W. D., October 4, 1917, outlined the organization recommended by the Surgeon General as directed by section 5, pointed out the necessity of centralizing the administrative functions, and indicated how the proposed organization would supplement the organization provided for by G. O. No. 39, A. E. F., etc. About this time a cablegram was received from the United States stating that the plan of organi-

zation of Veterinary Corps presented by the Surgeon General and Special Regulations No. 70 had been adopted.

While this memorandum was being prepared a memorandum was received in the Chief Surgeon's office, which was signed by A. C. of S. G–1, stating that the Commander-in-Chief had decided to suspend the application of so much of the Veterinary Corps regulations as was in conflict with the organization of the Remount Service, A. E. F., as outlined in G. O. No. 39, and that while the personnel of the Veterinary Corps would remain under the general supervision of the Medical Department, the Commander-in-Chief directed that the assignment of all veterinary personnel be made in accordance with recommendations submitted by the Remount Service. When this order was issued the Chief of the Remount Service assumed the direction of all the veterinary personnel on duty in the A. E. F.

On January 2, Majors Klein and Mason had an interview with A. C. of S. G–1. After an explanation of the organization the A. C. of S. G–1 stated he was opposed to organizing a separate veterinary service, as it would complicate the administrative work to have too many independent services, and the Veterinary Service would therefore have to be attached to the Remount Service. On January 18 the Chief Surgeon requested Majors Klein and Mason to prepare a memorandum stating the reasons why the Veterinary Service should not be attached to the Remount Service, and describing how it should be organized. This memorandum was completed and presented to the Chief Surgeon on January 20, together with a proposed order to authorize the organization of the Veterinary Service. This plan of organization was presented by the Chief Surgeon to a new Chief of the Remount Service, who expressed himself in favor of a separate Veterinary Service; the organization proposed met with his approval. The Chief Surgeon then incorporated the memorandum and the proposed order in a letter which was sent to the Chief of Staff on January 20, together with a letter from the Surgeon General to the Chief Surgeon, dealing with the organization of the Veterinary Service. Again the proposed organization was turned down.

Following this action further efforts were made to organize the service under the Remount Service and to prepare it in accordance with the ideas of A. C. of S. G–1. The new order attached the Veterinary Service to the Remount Service and provided that an officer of the Veterinary Corps should be designated as Chief Veteri-

narian and assigned to act as assistant to the Chief of the Remount Service, to exercise technical supervision over the Veterinary Service, to draw up regulations and orders and a detailed professional description of all preventive and curative treatments of animal diseases and injuries. The latter were to be printed and distributed to the commanding officers of all organizations containing animals and must then be followed by everyone.

The provisions of this order demonstrated again the failure on the part of staff officers to appreciate that the Veterinary Service could and should operate as independently as possible of the line organization if any uniformity and efficiency were to be obtained in the handling of animal diseases. On February 27, 1918, the Chief Surgeon was notified that a definite decision had been reached and that he should report veterinary personnel to Headquarters, Service of Supply, for assignment by the Remount Service. Major W. P. Hill, V. C., was appointed as Chief Veterinarian under this order.

Thus the General Staff saw fit to organize a veterinary service for the A. E. F. which was not in accord with the plan which had been adopted in the United States and which had been approved and urged by the Chief Surgeon, A. E. F., two successive chiefs of the Remount Service, and the two special representatives sent to France by the Surgeon General.

Condition of Animal Health

During this period of struggle for existence on the inside, the situation concerning animal health and efficiency was constantly growing worse in the field. By the first of March, 1918, there were six divisions in France and others were arriving almost daily. These divisions were provided with veterinary personnel intact, as organized on this side of the water; they were familiar with Special Regulations No. 70 and with the reports required by the Surgeon General. Upon arrival in France all this was discontinued and each one did his work more or less in his own way.

The first veterinary hospital was organized at Neufchateau during January and February, 1918. The first two regularly organized veterinary hospitals arrived in France April 10, 1918, and during the following three months Advance Hospitals Nos. 1 to 10, inclusive, Base Hospital No. 1, Army Mobile Hospital No. 1 and Corps Mobile Hospital No. 1 arrived and were stationed through orders issued by the Chief Veterinarian through the Chief Remount Officer.

About this time all shipments of animals from the United States

were discontinued in order to make room for men and supplies. To keep up the supply of animals, which now numbered only about 55,000, 50,000 were purchased from the French. These animals were for the most part young animals from 3 to 7 years old. They were taken from the French farms were they were accustomed to very careful handling and sent immediately to remount depots and artillery training camps where they were needed for immediate use. Needless to say, animals of this age became sick in large numbers, and the hospitals therefore were largely stationed at remount depots and training camps and assigned to duty under the commanding officers of such camps. In some instances hospitals were split into two or more sections and distributed to the centers of sickness. This condition continued through June, July and August, 1918.

Up to this time the American divisions had been attached to the British and French armies, and consequently the lack of organization of the Veterinary Corps and the scarcity in the supply of remounts had not been so keenly felt. During July and August, however, there was a great demand for horses in order that our own divisions might be fully equipped to take their place in the American First Army operating entirely independent of any other forces. Because of the lack of remounts these newly purchased and convalescent horses were put into training and rapidly taken to the front, where they were retained as long as they were of any possible service.

Another factor which greatly increased the inefficiency of our animals was the almost universal lack of horsemanship on the part of the line officers and enlisted men. Little or no attention had been given to the care of animals in our training camps, and many of our regiments whose personnel had been drawn with the understanding that they would be supplied with motors were at the last moment equipped with horses. As a result, horses were sometimes loaded on trains for a three or four days' trip with the harness on their backs. Animals were left harnessed while standing on picket lines awaiting orders; they were seldom groomed, and sometimes not fed or watered for two or three days or were fed hay and grain spread upon the surface of the mud in which they were standing. Some of these conditions were not always avoidable, but many times they could have been improved by the use of a little common sense and ingenuity in horse management.

By the last of August, 1918, these three factors, namely, lack of proper supply of remounts, lack of independent organization of the

Veterinary Corps, and bad horsemanship in general, were rapidly limiting the mobility of the Army.

About August 1, 1918, the First American Army started operating independently. The American area in France was divided into the Zone of the Army, which extended back a few kilometers from the front, and the Service of Supply, which bordered on the Zone of the Army and extended all the way back to the base ports which were used by the A. E. F. The S. O. S. was divided into the Advance, Intermediate and Base sections, and so far as the Veterinary Service is concerned it contained all the veterinary hospitals, remount stations and training camps, which, as previously explained, had become centers of sickness.

The duty of the Veterinary Service of the Army should have been to treat minor ailments, to control disease in the field and to evacuate inefficient animals to the hospitals of the S. O. S. The duties of the Veterinary Service of the S. O. S. should have been to control disease among animals of the remounts and training camps and to treat the sick and injured from all sources. This required a directing hand and head with jurisdiction over the entire service and with sufficient personnel at his own command to meet the situation. There had been no plan made for evacuating the sick from the Army. Divisions were treating their own sick in the organizations and the mobile sections. Hospitals were filled with sick from the remount depots and training camps. No definite asking had been made for securing more hospitals from the United States, there was no provision on tables of organization for an army or corps or section veterinarian, to say nothing of provision for an office force or transportation. These were strictly A. E. F. necessities and required revision of S. R. No. 70 to provide them.

Conditions at End of First Period

Briefly, the veterinary organization at the end of the first period consisted of the following:

1. A Chief Veterinarian acting as a technical adviser to the Chief Remount Officer.

2. A Chief Veterinarian of the First Army who was not appointed by or responsible to the Chief Veterinarian, A. E. F. The two offices had little in common.

3. Ten advance hospitals and one base hospital, which were serving chiefly remount depots and training camps.

4. One Assistant Chief Veterinarian in the Advance Section, S.

O. S., who was supervising the work of the hospitals in that section.

5. One army mobile hospital and one corps mobile hospital operating in the First Army.

6. About 30 divisions with their organizations, many of them scattered, artillery separated from infantry. The Division Veterinarian usually remained with Division Headquarters and supervised the work of only those units which were within his reach. The other units had no supervision.

By the end of August, 1918, there were 170,000 animals in the A. E. F. Of these there were on sick report about 45,000, in hospitals 18,000. Named in order of their importance the diseases were as follows: Mange, exhaustion and overwork, influenza and its complications, injuries and gunshot wounds, glanders, lymphangitis.

SECOND PERIOD

Organization and Personnel

As a result of these conditions, and as a result of the very efficient work of the British liaison officer who had been lent to our service to help with the organization, the Commander-in-Chief decided upon a radical change in the organization of the Veterinary Service. Accordingly the plan which had been presented by Majors Klein and Mason nearly a year previously was adopted. A new Chief Veterinarian, A. E. F., was appointed, operating directly under the Chief Surgeon but being vested with the establishment, control and administration of the Veterinary Service. Headquarters were necessarily established at Headquarters, S. O. S. Veterinarians were appointed in each army and corps, and Assistant Chief Veterinarians in each section of the S. O. S., namely, Advance, Intermediate and Base. Each army veterinarian and each chief of section were made responsible for the coördination and administration of the work of his department. Veterinary hospitals were placed under the command of their own officers and removed from remount depots as fast as possible. Steps were taken to collect the scattered units into whole organizations. The evacuation of sick animals from all divisions was insisted upon, and mobile sections were required to perform the duties of evacuating sections instead of acting as hospitals. The prompt rendering of weekly reports was immediately instituted, copies of Special Regulations No. 70 and the Guide to Veterinarians were distributed, and charts and instructions concerning the internal organization of veterinary hospitals and the method

of evacuating from divisions were forwarded to all concerned. A weekly news bulletin was instituted and sent to all veterinarians. A weekly statistical report and review of the situation, or a war diary, was prepared and sent to the Chief Surgeon, the Surgeon General, and the Commanding General, S. O. S. New tables of organization were prepared, providing assistants for the new positions created, and providing increased personnel for evacuating units.

Up to this time practically no promotions had been made in the Veterinary Corps, A. E. F. Many of the veterinarians with the first divisions and most of the casual veterinarians who went to France early had the rank of second lieutenant and had served nearly a year on foreign soil, perhaps almost constantly under fire, without receiving promotion, leave of absence or charge of station, while many of the officers arriving later had been promoted to higher grades before leaving the United States. This one condition alone led to a great deal of discontent and complaint among the veterinarians themselves. Recommendations for promotion had been made to the Chief Veterinarian, who was working under the Chief Remount Officer, while promotions were made through the recommendations of the Chief Surgeon, because the Medical Department was responsible for the veterinary personnel. With this situation existing it was very difficult to obtain promotion. After the change in administration, promotions were put upon the same basis as promotions in other branches of the Medical Department, and almost immediately about 50 were made, later another 50, and the third installment was ready to be forwarded when the armistice was signed and all promotions were discontinued for the time being.

The lack of personnel, both enlisted and commissioned, to evacuate and care for the number of sick animals, which was now rapidly increasing daily, was very apparent. The operations at the front were extensive, and aside from the injuries due to enemy fire the animals which were largely unfit when taken to the front rapidly decreased in efficiency. The First Army had but one army mobile hospital and one regularly organized corps mobile hospital with which to carry on these evacuations, and every veterinary hospital was attempting to care for nearly twice as many animals as it was intended to care for. The need for additional personnel was very urgent. Cables were immediately sent to the United States to rush hospitals and replacement units. In the meantime personnel was borrowed from the Remount Service and a great effort was made

to secure labor battalions. About 1,300 such troops were secured, half of them being assigned to the Chief Veterinarian of the First Army for evacuating purposes and the other half assigned to hospitals. Requests for as many more labor troops had been urged for some time, but the Chief Veterinarian was informed that no more were available.

To add further to the difficulties of evacuating animals promptly and with the least loss, the staff of the First Army for some time refused the use of the railroads for such purposes, insisting that evacuation should be made overland. While this question was being fought out, hundreds of animals were lost through being evacuated long distances overland when in a debilitated and sick condition, often lame, unshod, or suffering from serious wounds, while thousands were retained with divisions through the inability of the veterinary personnel to cope with the requirements of long overland evacuations. As a result of this combination of circumstances many animals died or were seen in a bad condition, often necessarily untreated, while in the hands of veterinary personnel. Inspectors often made reports upon such conditions, reporting what could be seen without considering the causes. Finally evacuation by rail was permitted and veterinary evacuating stations were established by the Chief Veterinarian and Army Veterinarian and were placed under the direct control of the Army Veterinarian. From this time progress was rapid. The First Army evacuated 11,507 animals to hospitals during the period September 7 to November 11, 1918, and during the St. Mihiel and Argonne offensives combined the veterinary evacuating stations handled 23,378 animals.

As a result of this organization and the policy of evacuating sick and injured animals to hospitals for treatment, the already overcrowded hospitals, 11 in number, were subjected to a still greater strain. Not only was it necessary to take care of twice as many animals as should have been allotted to the hospitals, but at the same time it was necessary for veterinary personnel to construct the buildings, roads and picket lines to accommodate these animals, as it was almost impossible to secure engineering units for such work at this time. In spite of this situation it should be recorded to the great credit of the assistant chiefs of sections and the hospital commanders and personnel that at no time were animals from the front refused admission to the hospitals.

By the end of October, 1918, help was in sight. Veterinary Hospitals Nos. 12 and 21 were arriving or were reported to be upon

the water, hospital locations had been planned ahead, and the Assistant Chief of Base Sections was prepared to meet organizations as they arrived at base ports so that they might receive instructions concerning their new duties and be forwarded to their locations with the utmost rapidity. Until these hospitals could be located an almost daily request was being placed with Headquarters, S. O. S., for additional labor companies to relieve the strain upon the hospitals. Some companies were secured, but not sufficient to supply the needs.

With help this near at hand, and with the Veterinary Corps in sight of its goal of a finished, efficient organization in the space of eight short weeks of reconstruction, the Commander-in-Chief issued telegraphic orders on November 3, just eight days before the signing of the armistice, which once again placed a line officer of cavalry, until recently employed in the office of the Remount Division of the Quartermaster Corps, as Chief Veterinarian. The telegram stated that there was no criticism of the handling of the professional side of the Veterinary Corps and that when the former chief became more familiar with the military organization there was no reason why he should not be reinstated.

The first work of the new chief was to secure immediately the additional personnel needed at hospitals which had been repeatedly requested by the former chief without results, and to place the veterinary hospitals which were then arriving daily. With the help of double the hospital personnel, and with the pressure relieved at the front through the signing of the armistice, great improvement began to be made in the condition of the hospitals. A Major of Engineers was added to the Chief Veterinarian's office for the purpose of securing additional construction as rapidly as possible. Four or five additional officers of cavalry were appointed as inspectors of veterinary organizations. Naturally their recommendations were chiefly along the line of improvement in the military organization of the hospitals, which under the circumstances could now receive much more attention, and which naturally led to considerable improvement in the work of the hospitals, judged from the military point of view. Beyond this no changes were made in the organization as it had been developed by its former chief. Let it be said to the credit of the new chief and to the veterinarians that each performed the work with which they were familiar and all continued to work for the best interests of the Veterinary Corps.

The First Army was withdrawn into the advanced section, the Second Army remained practically in position, while the Third

Army, provided with animals drawn from the First and Second Armies, was formed for the march into Germany. At this time the condition of the animals as a whole was very bad. The statistical reports of the Third Army, which was supposed to have the best of the animals, showed 20 per cent to be affected with mange, quite a number of cases of glanders existed, and debility and overwork were very common. During the march 1,600 animals were evacuated to hospitals.

As the armies became stationary the policy of evacuating to hospitals was largely reversed. Dipping stations were built in every divisional area and the cases were treated in their own organizations under the supervision of veterinary personnel. Veterinary supplies, which had been very meager and hard to obtain up to this time, began to arrive in quantities. The field unit chests and the officers' and farriers' chests were supplied for the first time. Lime and sulphur, which it had been almost impossible to obtain, were found in large quantities in the German territory. Clipping machines, which had never been provided in sufficient quantities, were secured. Animals were clipped and dipped during the entire winter, and as a result mange and emaciation were reduced to almost nothing by the fore part of May, 1919. By a similar very thorough campaign against glanders this disease was also practically eliminated. Lymphangitis was controlled largely by the destruction of all cases as soon as they made their appearance. Aside from these three diseases there were very few conditions requiring treatment, except the usual wounds due to kicks and treads, quittors, nail wounds, and paralysis of the penis, the latter probably due to influenza or general debility and overwork.

Hospitals and mobile sections settled down to real satisfactory work, as they had never been able to do before because of the overcrowded conditions and constant changing of animals. Receiving wards, medical wards and surgical wards were maintained in each, and much good work was accomplished.

The veterinary personnel of the A. E. F. on the whole compared very creditably with the personnel of other branches of the service and with the veterinary personnel of the Allied armies. The ability of our officers was on a number of occasions the subject of favorable comment from the office of the Director of the British Veterinary Service. The final results obtained were very gratifying and were the subject of many letters of congratulation and appreciation from commanding generals of divisions, corps and armies and from the

Commander-in-Chief himself. The Corps when once established always enjoyed the hearty support of the Commanding General, S. O. S., the Chief Remount Officer, and the Chief Surgeon and all his staff. The final picture of the Veterinary Corps, A. E. F., which should remain in our minds is that of an organization consisting of the following:

The Chief Veterinarian and his corps of assistants in the office of the Chief Surgeon.

Three section veterinarians with their assistants and office personnel.

Three army veterinarians and assistants.

Nine corps veterinarians and assistants.

Thirty-some divisions each with its veterinary organization.

Numerous remount depots and training camps with their organizations.

Nine corps mobile hospitals.

Six army evacuating hospitals.

Twenty-one large hospitals and two base hospitals scattered from Bordeaux to Coblenz, each commanded by veterinary officers and manned by Veterinary Corps personnel.

In all, 897 officers and 9,803 enlisted men thrown into one working organization in eight weeks during the heaviest fighting and after sickness and disorder had accumulated.

From September 1, 1918, to September 1, 1919, 317,690 animals were admitted on sick report; 167,873 animals were returned to duty; 948,065 animals were mallein tested and retested, of which 2,165 were destroyed upon first test and 556 upon retest; 105,019 animals were treated for mange, 21,163 for influenza; 2,079 for pneumonia, and there were 549 cases of lymphangitis and 885 cases of cellulitis.

The American service always enjoyed the hearty cooperation of the British and French services. Contact with the British service was maintained through Lieutenant-Colonel J. J. Aitken, the value of whose services in the organization work cannot be overestimated. Contact with the French service was maintained through the Franco-American Liaison Mission, which was headed by Colonel Brocq-Roussou. French liaison officers were appointed by him to the offices of the Chief Veterinarian, the Chief Veterinarian of each army and the Chief Veterinarian of the Advance Section. I believe the favorable acquaintances made by veterinarians with staff and line officers will be one of the greatest factors for good in the future development of the Veterinary Corps.

CONCLUSIONS

In conclusion, the experiences of the Veterinary Corps in France demonstrated the following:

1. That most American veterinarians are sufficiently well trained professionally to render an efficient service in the Army, but that they should have a period of special training to teach them to adapt their knowledge to army conditions.

2. That they are quick to adapt themselves to field service and are capable of commanding troops.

3. That the attitude of the Regular Army toward an Army Veterinary Service had not permitted or encouraged leadership among veterinarians of the Army, and as a consequence there were not sufficient veterinarians of both military and administrative experience to fill administrative positions early in the war.

4. That the organization which was finally adopted, and which placed a veterinarian at the head of the service under the direction of the Chief Surgeon, was an efficient organization, capable of being adapted to any circumstances by altering the units which composed it to suit conditions.

5. That the Veterinary Service should have a representative upon the General Staff for the purpose of guiding the Staff and guiding the service from the very initiation of every policy.

Dr. Wilbur H. Hurst severed his connection with the Bureau of Animal Industry February 29, 1920. Dr. Hurst entered the Bureau in January, 1903, and served in various phases of activities, having during the past two and a half years been assigned to hog cholera control work in Iowa.

Dr. C. C. Hooker, after having retired from practice for the past two years, has entered partnership with H. Wood Ayers, formerly Deputy State Veterinarian of Oklahoma. They are located at Oklahoma City, with a well-equipped modern hospital.

Dr. Bernado Crespo of the Cuban Agricultural Department was a recent guest in Lexington, Ky., visiting several famous studs. He is interested in Thoroughbred horses and purebred beef cattle, and spent most of his time on the stock farms in the Blue Grass State.

CLINICAL AND CASE REPORTS

BOTULISM IN CHICKENS

By GEORGE H. HART

Division of Veterinary Science, University of California

OUR attention was recently called to a severe loss sustained among a flock of 800 fowls in Santa Clara County, California, from feeding spoiled string beans, home-canned by the cold pack method. The beans were put up in large glass jars during the Summer of 1919. On January 26 or 27, 1920, four jars of these beans were sent to the kitchen to be prepared for the table. Upon removing the lids, the cook noticed a very bad odor to the beans in all four jars and therefore threw them into the garbage pail.

The contents of this garbage pail, consisting of the beans and other kitchen refuse, were fed to the chickens probably on January 27, 1920. The following evening the fowls began to show symptoms and on Thursday, January 29, 250 died. Thursday evening four affected hens were brought to the Division of Veterinary Science, University of California, and from the typical symptoms manifested a diagnosis of botulism or limberneck was made. (This application of the term limberneck should not confound this disease with wryneck of poultry.) The following day a visit was made to the ranch and 300 fowls were found affected with the disease in its various stages.

The chickens shown in figure 1, even though so far advanced in the disease as to be unable to hold their heads off the ground or to stand up, were still able to lay eggs and many eggs were found in the yard containing the affected birds.

An interesting observation was made by the attendant in finding a wild bird, which had had access to the feeding troughs, affected in a similar manner to the chickens. The bird was so badly affected that the attendant was able to pick it up, but later it managed to get under a building and was not seen at the time of our visit. From the description of the bird, it was probably a California linnet.

A healthy cockerel at the Veterinary Science Laboratory was fed the crop contents of one hen dead of the disease on January 29 and the crop contents of another on January 30. It developed a typical case of the disease, showing the first symptoms on January 31, and, after being at the point of death for several days, began to show

improvement and gradually recovered. This was of interest in showing the length of time the toxin remained in the crop despite the fact that the chickens had probably eaten other normal food before they showed evidence of the disease.

Figure 2 shows the typical symptoms of an affected bird. These identical symptoms have been produced in our laboratory with toxin from known strains of *Bacillus botulinus*.

In all, a total of 643 chickens, valued at $1,500, died in 4 days. This is the largest single loss of this nature which has ever been reported, to our knowledge. Minor losses from a similar cause have not been uncommon in this State. From several of these out-

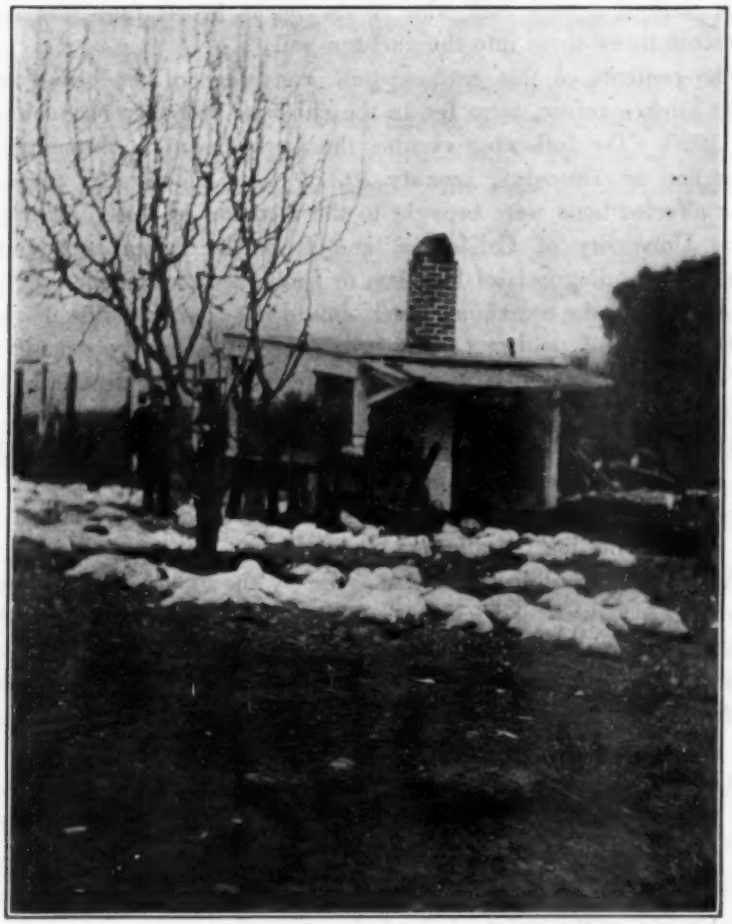

FIG. 1.—*Fowls in Advanced Stages of Botulism*

breaks, E. C. Dickson and G. E. Burke of Stanford University have isolated *B. botulinus.*

The disease from this source can readily be prevented by discarding all spoiled canned goods or by thoroughly boiling them before feeding to poultry or other animals. Boiling destroys the toxin of *Bacillus botulinus,* although sterilization under steam pressure is necessary to kill the spores of the organism. There is no evidence at present to show that the botulinus organism will produce its toxin in the body of man or domestic animals.

FIG. 2.—*Fowl Showing Typical Symptoms of Botulism*

Dr. R. E. Christopher, in charge of hog cholera control work in Iowa, resigned his position with the Bureau of Animal Industry January 12, 1920, to engage in general veterinary practice in Tama County, Iowa. Dr. Christopher had been in the Bureau service since 1908.

Dr. T. B. Harries, after serving faithfully in the great World War, has returned to Strathmore, Alberta, where he is in the employ of the Natural Resources Department of the Canadian Pacific Railway.

RECENT PUBLICATIONS

THE PATHOLOGY OF DOURINE, WITH SPECIAL REFERENCE TO MICROSCOPIC CHANGES IN NERVE TISSUES AND OTHER STRUCTURES. By Robert J. Formad. In Journal of Agricultural Research, vol. 18, No. 3, p. 145.

ABSTRACTS

OSTERTAG'S METHODS OF TUBERCULOSIS CONTROL. Eber. Deut. Tierärztl. Wchnschr., 1918, p. 395. Abstract in Monatsch. Prakt. Tierheilk., May, 1919, p. 571.

Eber in summing up the experiences with Ostertag's voluntary tuberculosis control methods, states that by consistent and faithful application of the procedure there is secured a rapid checking of the affection even in badly infected cattle establishments. However, there is not brought about an eradication of the disease. The procedure has not shown itself equally useful for all agricultural conditions; and besides, the results depend very much on the cooperation of the individual owners. Moreover, in the reintroduction of this procedure after the war, the following points must be taken into consideration: The establishments are given at least two clinical examinations each year. Of three yearly bacteriologic mixed milk examinations, two are undertaken in connection with the clinical veterinary examinations. All cattle affected with open tuberculosis are promptly discovered and removed. With young cattle as well as with older ones, care is taken to build up the body strength and raise the powers of resistance. Finally there is guaranteed to the cattle owner with the least delay a sufficient indemnity for the loss caused by tuberculosis. L. T. GILTNER.

RESULTS OF GLANDERS CONTROL IN THE SIEBENBURG ARMY, 1917. Nuzeitig. Wiener Tierärztl. Monatsch., 1918, p. 336. Abstract in Monatsch. Prakt. Tierheilk., May, 1919, p. 568.

According to the experiences of the Siebenburg army, the eye test, on account of its simplicity and quickness, has proved itself indispensible. The obligatory malleinization must be extended to all the horse establishments and be repeated in a given time. In judging the mallein eye test an accompanying thermic reaction is of value. For clearing up doubtful reactions, the skin test is drawn on. The production of a concentrated mallein is necessary. The positive mallein reaction proves an established infection. The destruction of clinically latent glanders cases (only positive to mallein or blood test) is considered superfluous and from the farmer's standpoint unjustifiable. These latent forms can be considered harmless so far as spreading the infection is concerned if they show a normal body temperature after the disappearance of the mallein reaction

(for agricultural use in restricted districts). Through the simultaneous application of the eye test and the blood tests, the mistakes of one are corrected by the other. L. T. GILTNER.

STUDY ON INFECTIOUS ANEMIA OF HORSES. R. Abelein. München. Tierarztl. Wchnschr., June, 1919, vol. 70, p. 389.

During a period of 4 months in 1917, infectious anemia was observed in a group of horses whose general hygienic conditions were excellent, except for slightly insufficient feed. The most striking symptom was remittent, intermittent, very high fever. It appeared suddenly, often rising to 41 degrees (106° F.) during the first day, persisted for several days with only a slight rise or fall of 1 degree and then quickly subsided; for example, in a single day the temperature dropped from 41.7 to 38 degrees. The temperature curve generally rose and fell abruptly with a level plateau. A period of normal temperature followed until there was a recurrence. Rather remarkable were cases where temperatures dropped to 36.6 (subnormal), followed by recovery. During the observation period of 4 months the greatest number of attacks of fever observed in the same horse was 4; maximum duration of fever, 13 days; minimum, 1 day; longest intermission between fevers, 2 months; shortest, 2 days.

Otherwise the symptoms were not striking. Only when the fever was high did the animals exhibit unsteady gait; they lay down in the stall. Sometimes the head was stretched out as in the beginning of strangles. In some of the animals before death there was edema of the chest, sheath, and legs.

In the beginning of the disease conjunctiva were pale red, often mixed with a slight brown or gray. After chronic illness this changed to porcelain-white. Eyelids not swollen, but the conjunctiva thickened, very moist.

During fever pulse was faint, up to 60, during fever-free periods, up to 48. Pulse rose 10 beats during easy walking and became arythmic. During rest the apex beat seemed strengthened. Before death pulse rose rapidly to 120.

The nasal mucous membranes were reddened; in a few cases there was a very slight bilateral nasal discharge. Pressure upon the upper tracheal rings sometimes caused coughing. Digestion was disturbed only in very severe cases. Nothing abnormal found in genito-urinary system nor in the urine.

The pathological picture consisted practically only in the inter-

mittent fever, slight catarrh of the upper respiratory passages, heart weakness, emaciation, and later anemia, although anemia did not always develop.

Appearance of animals on autopsy is described in detail; nothing striking. W. N. BERG.

BACTERIOLOGICAL STUDY ON BRUSSEL'S DISEASE (INFECTIOUS BRONCHO-PNEUMONIA IN THE HORSE). Schroeder. Berl. Arch., 1919, p. 1. Abstract in Monatsch. Prakt. Tierheilk., May, 1919, p. 570.

The studies on the etiology of infectious broncho-pneumonia of military horses known as Brussel's disease, undertaken under the direction of Prof. Reinhardt, show chiefly that artificial infection by contact as well as by injection and ingestion of lung extract and nasal mucus was not successful. In the material studied there were found regularly bipolar bacteria, pure cultures of which did not produce the Brussel's disease in healthy horses. Therefore, the author believes that in the process of taking the infection, there are acting besides the bacteria predisposing factors such as influence of temperature, overexertion, youth and Belgian breed. In the purulent broncho-pneumonic processes, streptococci and staphylococci also appear to play a part. The infectious broncho-pneumonia has nothing to do with strangles. L. T. GILTNER.

DIARRHEA OF LAMBS. Oppermann and Lange. Deut. Tierärztl. Wchnschr., 1918, p. 519. Abstract in Monatsch. Prakt. Tierheilk., May, 1919, p. 568.

In the cases of scouring in lambs studied, colon bacilli and capsule bacteria (*Diplococcus capsulatus*) were shown to be causative agents, the bacteriologic differentiation of which is often difficult. Besides microscopic examinations, cultural tests were undertaken. The disease sets in a short time after birth; after 12 hours, at the latest, 2 days, there appears a severe diarrhea with febrile temperature (104.9–106.7°), the conjunctivæ show a diffuse dark reddening. The disease usually leads to death in from 1 to 2 days. Treatment consists chiefly in prophylaxis (disinfection, separation).

L. T. GILTNER.

ASSOCIATION NEWS

Proceedings of the Fifty-Sixth Annual Meeting of the American Veterinary Medical Association

Held at the Hotel Grunewald, New Orleans, La., November 17 to 22, 1919

(Continued from the March number.)

WEDNESDAY MORNING, NOVEMBER 19, 1919

The meeting was called to order by President V. A. Moore at 9 a. m.

THE PRESIDENT: The first item of business is the report of the Executive Board.

FURTHER REPORT OF EXECUTIVE BOARD

DR. MAYO: The following applications have been approved for membership: Dr. L. J. Bonner, Linville, Ala.; Dr. J. J. Jones, Jackson, Miss.; Dr. J. B. Monroe, Providence, R. I.; Dr. R. C. Lambert, Wichita, Kans. The Executive Board recommends that Dr. Harrington of St. Joseph, Mo., who graduated in 1919 from the St. Joseph Veterinary College, be admitted to membership under the suspension of rules.

Dr. HOSKINS: I move the recommendation of the committee be approved.

(The motion was seconded by Dr. McAuslin and carried.)

DR. MAYO: It was recommended by the Executive Board that a special committee be appointed by the President to devise some means for an affiliation or connection between State and local associations and the American Veterinary Medical Association, this committee to report at the next meeting of the Association.

DR. KINGSLEY: I move the recommendation be approved.

(The motion was seconded by Dr. Hoskins and carried.)

DR. MAYO: The Executive Board recommends that the report of the Committee on Anatomical Nomenclature be received and laid on the table until the report of the work of the International Committee be received.

(It was moved by Dr. Hoskins and seconded by Dr. Moore that the recommendation be approved. Carried.)

THE PRESIDENT: I wish to announce the committee that was recommended and approved yesterday to consider the combination of the offices of Secretary and Editor of the JOURNAL. I will announce as such committee Dr. Stange, Dr. Munce and Dr. Hilton. The committee that has just been approved I will announce a little later. Are there any chairmen of any committees that have not reported?

REPORT OF COMMITTEE ON LEGISLATION

DR. W. H. HOSKINS: I am ready to report on the Legislation Committee.

Mr. Chairman, gentlemen, the Committee on Legislation has been active during the past year.

First—In aiding the passage of the bill that afforded the Bureau of Animal Industry veterinarians the increased amount of pay of $240 provided for all those whose salaries were $2,500 and less.

Second—In joining in support of the added sum for salaries of those in the Department of Agriculture that made it possible to add an additional $120 to the salaries of many of the Bureau of Animal Industry veterinarians whose salaries were $2,000 or less per year.

Third—The Department of Agriculture appropriation for the year ending June 30, 1920, contains an appropriation of $100,000 that enables the Bureau to reestablish equine meat inspection that means the solving of the problem of two millions or more horses on the Western ranges unfit for any purpose save that of food, leather and other commercial purposes. This appropriation likewise affords an outlet for hundreds of horses on many farms—many that are lame, blemished, broken-winded, and are undesirable and unprofitable to keep for utility purposes and that are consuming food and forage that can be more profitably fed to other animals and lessen the cost of food to horse owners, thus contributing to their retained uses in the field of commerce.

Fourth—When the Volstead prohibition bill reached conference it was discovered that a provision permitting the veterinarian to prescribe liquors under like conditions as the physician had been omitted. Efforts to correct this defect were unavailing, as the prints of the bill in contention by the Senate and House conferees did not enumerate this as one of the points at issue. We were assured that the presentation of an amendment later covering this omission would meet with the approval of the House and Senate, as the omission was not intentional.

A bill known as Senate Bill No. 3011, introduced by Senator Calder of New York, planning to make the provisions of the Federal food and drug act the only standard of regulation for enforcement in any of the States, has received the attention of your committee. This measure would negative the acts of many legislatures that have established more exacting standards for foods and drugs within their commonwealths.

The Committee on Legislation of the American Medical Association and many food and drug departments of the different States have filed protests against its further consideration or passage. Your committee has filed a vigorous protest against it, as it would let down the bars in many States for the increased sale of domestic animal nostrums, cure-alls and mixed foods of doubtful economic value. This bill is resting in the Senate Committee on Agriculture and should receive our Association's disapproval and the individual opposition of every member.

While the War Department through its General Staff has agreed upon many points of Army reorganization that involves the Veterinary Corps and which will be presented in the next Congress, the probability of passing a reorganization bill for the Army until after the 1920 campaign is uncertain and improbable.

Your committee is endeavoring to keep in touch with all proposed Federal legislation that involves the welfare of the profession and its best interests.

Respectfully submitted,

W. HORACE HOSKINS, *Chairman.*
S. J. WALKLEY.

(It was moved by Dr. Moore that the report be received. Seconded and carried.)

REPORT OF LIAUTARD MEMORIAL COMMITTEE

THE PRESIDENT: Is there any other committee ready to report?

DR. BRENTON: I beg to submit the following as the report of the Liautard Memorial Committee:

In the absence of Chairman Ellis of this committee, this body, represented by Drs. Brenton, Dalrymple, William Herbert Lowe and W. Horace Hoskins, report that they have several forms of a memorial under consideration.

The suggestion that it take the form of a painting of Alexandre Liautard in the Saddle and Sirloin Club gallery is not approved.

We therefore report progress and recommend the continuation of the committee.

Respectfully submitted by the committee,

ROBERT W. ELLIS, *Chairman,*
W. HORACE HOSKINS,
S. BRENTON,
WM. HERBERT LOWE,
W. H. DALRYMPLE.

(It was moved and carried that the report be received.)

REPORT OF COMMITTEE ON HISTORY

DR. R. C. MOORE (St. Joseph, Mo.): Mr. Chairman, the Committe on History is ready to report as follows:

Owing to the long distances intervening between the residences of the members of this committee, the Chairman found it very difficult to consult with the members regarding the general plans to be pursued, so has found it necessary to lay out such plans as he could and ask the members of the committee to carry out such parts as he saw fit to request, and so far as this has been carried out the members to whom certain portions of the work was assigned have responded heartily.

The plan selected was as follows: To entrust to one member the compiling of the history of the Veterinary Service in the American Army, to another member that of the B. A. I., to another the history

of the profession in Canada, to another a history of the development of the profession as a result of the efforts of our heroes who carried the banner as pioneers in the early days of our country. Then by appealing to the various State Associations we hoped to secure a history of the profession in the several States, including the pioneers of the States, the dates of the organization of their State Associations, the enactment of their laws pertaining to veterinary practice and such other facts as might be of interest; and lastly, to obtain through friends and representatives of our educational institutions now in existence, and those of the past, facts pertaining to their organization, development, period of existence and probably a roster of their graduates and later such other facts as may present themselves, so that when the time comes a committee can compile a book from the data thus procured that will be of real value to the profession.

The procuring of the data of the Army was entrusted to Major A. L. Mason and through his efforts, assisted by Major Olaf Schwarzkopf, we are able to present a splendid sketch of the Army veterinarians from the time of the Revolution to the date that the United States entered the World War.

Dr. U. G. Houck kindly consented to take care of the B. A. I. section, and his elegant report herewith presented speaks for itself.

Dr. Charles Higgins gladly accepted the task of furnishing a history of the profession in Canada in all its details, but has not had sufficient time to complete his work.

I expected to obtain through the efforts of Dr. George H. Berns a history of the pioneer banner bearers, but owing to a protracted illness of your Chairman at the time I could have pushed this phase of the work and that pertaining to the State Associations and educational institutions I was unable to carry this phase of the work along, but hope the start that has been made will prove of service to future workers.

We recommend that a committee be provided to continue this work, with the hope that in a few years sufficient data may be procured to enable the publication of a book that will prove both a pleasure and a benefit to the present and future veterinarians of America.

R. C. MOORE, *Chairman.*
U. G. HOUCK.

DR. MOORE: Now, I am going to ask Dr. Houck to read a portion on the outlines of the work that we have been able to compile this far.

DR. U. G. HOUCK (Washington, D. C.): Mr. President and fellow members of the A. V. M. A., we have here some material which is to be submitted and if considered worthy will be later published in the JOURNAL. Therefore you will have more time to read it than you will to listen to it at this time, and I am only going to make a few remarks in submitting this:

First, we have here Major A. L. Mason's report, in which he

collaborated with Major Schwarzkopf, on "The Historical Development of the Veterinary Service in the United States Army." In this report he refers to various subjects which I will just mention in connection with the introduction. He refers to the period of farriers from 1792 to 1862; next, the irregular veterinary service during the Civil War; the after-effects of the war on the service; the period of transition from horse doctor to veterinarian; veterinary supply tables for the Army; the veterinary surgeon in the Indian campaign; pioneer work in Army veterinary legislation; the Army veterinary bill of 1887; the Army veterinary bill of 1894; the Army appropriation bill of 1901; the Cuban War up to December, 1898; the Philippine War, 1899 to 1902; official divisions of Army veterinarians. I have read over part of this report and find it very interesting indeed, but as it will appear in the JOURNAL, no doubt, you will have an opportunity to read it.

In submitting my report on a historical sketch of the United States Bureau of Animal Industry, I will say that as a member of the committee appointed to compile a history of the veterinary service in America I was invited to give my attention to the facts bearing on it. I appreciate the honor of being a member of this committee, but when I accepted I did not realize what would be necessary to accomplish the undertaking. Before I had progressed far I realized that I would not have the time to do the reading necessary to collect the information for a complete history, and I decided to limit my efforts to the preparation of only a brief historical sketch of the bureau which has become such a large, important organization in the Department of Agriculture.

There were so many important conditions and events prior to the establishment of the Bureau of Animal Industry that created the need of a strong veterinary organization operated under the patronage of the National Government. There were so many important duties committed to the Department, and it has accomplished so much in the protection of property and the alleviation of animal suffering, in guarding public health and preserving and extending our export trade, that in preparing this paper it seemed expedient to divide the subject into epochs, as follows: First, the establishment of the Bureau in 1884. Second, the administration of Dr. D. E. Salmon, the first Chief of the Bureau, from 1883 to 1905. Third, the second Chief, Dr. A. D. Melvin, from 1905 to 1917; and fourth, the administration of Dr. J. R. Mohler, the third Chief of the Bureau, from 1917 to the present time.

I regret that I have been unable to complete the sketch in time for this meeting, as it was necessary for me to do this work in connection with my regular official duties. I have been obliged to confine my efforts to a review of the conditions of the first epoch. If continued on the committee I shall probably be able to complete my task before the next meeting of this Association.

In the paper that I have prepared, after the first introduction, I have taken up the subjects and given a brief sketch of (1) contagious

pleuro-pneumonia, which was the most important factor leading to the organization and establishment of the Bureau of Animal Industry; (2) the export trade in cattle and meats; (3) hog cholera; (4) animal transportation, domestic and foreign; (5) meat inspection; (6) quarantine; (7) the opposition that the bill met when it was presented to our Congress. I think that is all I will read this morning. The time is limited, and you will have an opportunity to see these historical sketches published in the JOURNAL.

(Motion was made by Dr. Hoskins that the report be received and the committee be continued. Seconded and carried.)

THE PRESIDENT: I am sure we are very pleased with the progress that has been made in this historical review.

I think that owing to the lateness of the hour we will defer calling for other reports until our next meeting, and I hope that all of the other committees will be ready at the next general session to present their report.

The program of the morning consists of the report of the Special Committee on Abortion Disease. You will remember that last year there was a special committee appointed to investigate this special disease, and that committee is reporting here by separate papers by different members. Dr. Eichhorn, have you any report?

(Dr. Eichhorn read the report of the Committee on Infectious Abortion Disease of Cattle, as follows:)

GENERAL REPORT OF THE COMMITTEE ON INFECTIOUS ABORTION DISEASE OF CATTLE

GENTLEMEN: In considering the wide scope of the work with which this special committee was confronted, it was primarily deemed essential to group the various phases of the problem under various headings to cover the entire scope of the work in a systematic manner.

With this in view the committee has formulated an outline for the study of the condition which has been termed infectious abortion as follows:

1. Abortion is the expulsion of a dead fetus from the uterus.

2. All abortions of an infectious character are not due to one specific virus.

3. A certain virus may be the dominant infection in the genital system and may be the prevalent cause of abortions in a given herd or country.

4. What are the conditions within the uterus associated with the expulsion of the fetus, and in what sequence do they develop?

5. Abortion is not the disease, and the inclusion of this term as a part of the name is confusing and misleading and should be discarded.

6. The various infections capable of causing abortion should be studied and their relative importance determined.

7. In the elucidation of the above principles, studies in the field of pathology, etiology, symptoms, diagnosis, prevalence, nomencla-

ture, treatment and control will have to be made and the existing and prospective literature on the subject analyzed. The papers and the studies of the kind indicated should be presented to the Association from time to time as interim reports of the committee.

An analysis of the outline would show that the study of abortion due to specific causes has been well provided for in the program, but on account of its comprehensive scope at the best only part of these investigations could be taken up by the members of the committee and will be presented as individual reports. The subjects taken up by the members of the committee are as follows:

The Diagnosis of Bovine Contagious Abortion, by Dr. C. P. Fitch.

The Influence of Health of the Calf upon its Fertility at Breeding Age, by Dr. W. L. Williams.

The Bacteriology of the Reproductive Organs of the Aborting Cow in Comparison with that of the Aborted Fetus, by Dr. Ward Giltner.

A Review of Several Publications on Infectious Abortion Disease, by Dr. E. C. Schroeder.

While at first glance it would appear that the work in the past year has not materially furthered our knowledge with regard to the many obscure phases of this condition, nor have means been developed by which the tremendous economical losses resulting from abortion disease could be materially checked, nevertheless the committee has prepared a working basis by which the studies may be systematically carried out and which without doubt will result in the future in the material advancement of our knowledge with regard to this problem.

Aside from the activity of the committee, several very important publications have appeared on this subject, and a member of this committee has kindly consented to review the most important literature, which, together with the individual reports of the members of the committee, will furnish the members of the profession all the new knowledge which has been gained in the study of the disease.

The committee is of the opinion that the Association should continue to appoint a committee for the study of infectious abortion disease of cattle, as it is impossible even to forecast the time which will be required for the completion of the skeleton outline prepared by this committee; and furthermore, that cooperative work carried on by such a committee would result in a closer application and specialization in the problems and also would prevent a great deal of duplication of work which has been so very common in the past.

Another suggestion which the committee offers is that the Association appropriate a sum not to exceed $500 for defraying the expenses of the committee, as it is essential that the committee should meet as often as circumstances would permit for the purpose of reviewing and outlining the work and also for the purpose of discussions which are essential and of great advantage for the effective working of a committee of this kind. It is hoped that the continuance of the work will ultimately lead to definite results which we

are seeking to obtain with regard to the tremendous losses sustained from abortion and its allied affections.

A. EICHHORN, *Chairman*,
E. C. SCHROEDER,
C. P. FITCH,
W. L. WILLIAMS,
WARD GILTNER.

(A motion was made by Dr. Hoskins that the report be received and the committee be continued. Motion seconded and carried.)

THE PRESIDENT: Dr. Eichhorn, I noticed that the sequence of papers was different as outlined in your report than given on this program. Does it make any difference in the general comprehension of the subject whether we call on them in the order given here or in your papers?

DR. EICHHORN: I don't think it will make any difference, because some will be presented in title and some by abstract.

THE PRESIDENT: The next will be by Dr. Giltner.

(Dr. Giltner read paper on "The Bacteriology of the Reproductive Organs of the Cow and its Relation to that of the Meconium of the Calf," which is published elsewhere in this number of the JOURNAL.)

THE PRESIDENT: You have heard this paper. As it is a part of a series of papers, do you wish to have it discussed at this time, or do you wish to wait and have it discussed?

DR. HOSKINS: Wait until the others are presented for discussion.

THE PRESIDENT: It is suggested that we wait, and if there is no objection the next will be on "Infectious Abortion Disease," a short review of several publications by Dr. E. C. Schroeder.

DR. EICHHORN: Mr. President, I move that this paper be read by title. Although I believe this paper is of the greatest value to the members of the profession, as it affords an opportunity to see in abstract form everything which has been published in the past year, in view of the short time we have I suggest that it be read only by title.

THE PRESIDENT: If no objection, it will be so ordered.

(Dr. Schroeder's paper will be published later.)

THE PRESIDENT: The next is "The Diagnosis of Bovine Contagious Abortion," by C. P. Fitch.

(Dr. Fitch read his paper, which appeared in the JOURNAL for February, 1920.)

THE PRESIDENT: The next paper, I think, Dr. Eichhorn gave the title in the report. The program says the subject is to be announced. Dr. Williams, do you want the paper announced?

DR. W. L. WILLIAMS: Mr. President, the contribution that I made on "The Influence of the Health of the Calf upon its Fertility at Breeding Age," is too long for presentation in full. I have been unable to abstract it in such a way that I feel that I will be understood. Our time is very short, and the next paper upon the program, that upon "White Scours or Calf Scours," is related and

fundamental to what I have attempted to place before the Association in this contribution. I therefore ask, under the circumstances, that it be accepted by title and referred to the JOURNAL for publication.

THE PRESIDENT: You have heard the suggestion by the author of this paper. There being no objection, due to the shortness of time, we will hear the next paper, "White Scours or Calf Scours," by Doctors Williams, Hagan and Carpenter.

(Dr. Williams's papers on "Influence of the Health of the Calf upon its Fertility at Breeding Age" and on "White Scours or Calf Scours," will be published later.)

THE PRESIDENT: The next paper will be "The Abortion Disease and its Control," by Dr. J. F. DeVine.

(Dr. DeVine read his paper, which will be published later.)

THE PRESIDENT: The next paper is by Dr. Potter on "Field Observations in the Control of Abortion Disease."

(Dr. Potter read his paper, which will be published later.)

DISCUSSION OF PAPERS ON INFECTIOUS ABORTION

DR. WILLIAMS: There are some very interesting points in Dr. Potter's paper which are not wholly clear to me, and upon which I would greatly appreciate an explanation by him.

On page 2, paragraph 2, line 15 of his manuscript, I find the statement: "The known difficulties of treatment and the lack of dependable immunizing agents necessitated that preventive rather than curative methods be taught."

On page 4, paragraph 3, he states: "Especial emphasis was laid on the immunity conferred by the disease, which caused it to subside in herd after herd."

In the first statement he denies the existence of a reliable immunizing agent, and in the second statement turns about face and declares the disease itself such an immunizing agent.

If the disease in readily transmissible and one attack regularly confers immunity, why may not all the cattle of a State or Nation be simultaneously immunized by universal compulsory inoculation as in smallpox? The loss of a single calf crop would certainly be a trifling price to pay for the elimination of abortion.

In his control scheme on page 5 Dr. Potter says: "All aborters and those threatening abortion can then be removed to a separate inclosure." Then after they are recovered he states they may rejoin the herd and at the time when grazing is ample he adds: "The cows then go out clean and there are none to disseminate infection, and as most of the aborters will have become immune the disease will subside."

I would like to ask Dr. Potter if, in his judgment, cows may not occasionally expel an embryo or fetus unobserved? If so, is there any danger to the herd from such a cow, and how remove the danger? Will she recover and become immune in the herd as well as in quarantine? Does it ever occur in a large herd of range cattle

that a fetal cadaver is found and the cow which has expelled it can not be identified? Will the destruction of the fetal cadaver eliminate the danger to other cows? Does Dr. Potter believe that all cows which have "abortion disease" abort, or do some infected cows calve? If they calve are they safer in the herd than aborters, and why?

On page 6, Dr. Potter states: "The cow that produces a healthy calf each year, in spite of the presence of infection, and the cow that acquires a strong immunity following a single abortion are kept to transmit these desirable tendencies to their offspring."

Why, if this plan is pursued, should there be left any abortion in existence? If those cows which do not abort grow calves which will not abort because of an inherited power of resistance, and the calves from those cows which have aborted once and are immune inherit immunity from their mothers and therefore do not abort, why should we worry about abortion at all? Why is it that the presence or absence of the infection should alike produce immunity in both cow and fetus?

On page 5, Dr. Potter states: "The experience of the writer leads him to believe that the disease among range cattle is pure abortion disease. This belief comes from * * * the relative infrequency of the common complications. Retained after births are not nearly so frequent as among dairy cows."

What does Dr. Potter mean by "pure abortion disease?" Does he hold that in a given case of abortion one germ causes the expulsion of the fetus and another germ prevents the expulsion of the afterbirth? Is there a "contagious abortion disease" and an "infectious retained-afterbirth disease" working simultaneously in the same animal?

On page 12, Dr. Potter states: "The question of the natural period of incubation is one on which we might with profit have more information." He then cites two instances in which he claims to have definitely fixed the period of incubation in one group at three months, in the other at five months. Just what does Dr. Potter mean by "incubation period" in abortion disease? Is it the period elapsing between exposure and the expulsion of a fetal cadaver? If such is the case, would the period of incubation of syphilis in woman be the time elapsing between exposure and the expulsion of a syphilitic fetal cadaver? If she aborted three separate times owing to uterine syphilis would the period of incubation of the abortion disease close with the first, second or third abortion?

Or take a heifer now in our hospital about eight months after conception. Her fetus died but was not expelled. Seventeen months after conception she came to the hospital and we removed nearly the entire fetal cadaver through the cervical canal. But a humerus and a radius of the fetus remained in the apex of the uterine horn, and at about 19 months after conception we performed laparohysterotomy and removed the two detained bones. I wish Dr. Potter, who has evidently given much thought to the incubation period, would state what the incubation period was in this case,

that is, when the period terminated. I do not know when the exposure occurred. Did the incubation period terminate with the death of the fetus at about 8 months, the removal of most of the cadaver at about 17 months, or the removal of the remnant of the cadaver at about 19 months?

If a cow is infected with abortion disease and yet gives birth to a vigorous calf at 285 days, what is the period of incubation? Is there one period of incubation each for the cow and the fetus?

In the two groups of cows with incubation periods of 3 and 5 months respectively, were both groups due to the same germ, and if so, what evidence of identity has Dr. Potter to submit? Were the exposed pregnant cows free from all infections at the time of exposure capable of causing abortion? If so, upon what evidence is his statement based?

In the second paragraph on page 14 Dr. Potter states: "Our present medical knowledge is altogether inadequate for controlling abortion disease." Ten lines beyond he says: "The more the writer studies the situation the more firmly convinced is he that the disease can be controlled." How does he reconcile these two statements?

DR. POTTER: I would like to say that this analysis reminds me of what we sometimes see in legal cases, where the lawyer presents a hypothetical question of about 45,000 words for the unlucky defendant.

In the 1916 meeting of the United States Live Stock Sanitary Association Dr. Lamb of Colorado presented a short statement on range abortion in which he outlined many of the difficulties in controlling abortion disease in cattle. I had the good fortune of making a trip through the West, and I studied as best I could by consultation with stockmen and veterinarians of that section the disease under their direction. Now, Dr. Williams' statement goes into all of the difficulties and all of the discussions that we have been having for these many years concerning the minor details of abortion disease.

In answering those, all I wish to say is that apparently, as far as anybody can tell, the plan works. We control the gross infection; we take care of the aborting cows; when controlling our abortion in such a way we concentrate the abortions in the time that the abortion can be controlled. Any of you know that for a large part of the year you can not possibly handle those animals in any way, and this is only an effort to meet the difficulties of the situation, and as far as we can tell, it works.

DR. WILLIAMS: May I give just a word of explanation? I asked these questions rather that they should go on record, and I know it would be unfair to epect Dr. Potter to answer them.

DR. C. A. ZELL: Mr. President, I am just thinking about the curative agents and the abortions we have, and I think one product like phlemin is very much neglected. I think it could do a lot of good in the abortion of cattle, using it not only as an intravenous injection, but also injecting the uterus and vagina. I did some experiments, but they are so few that I really can not draw any conclusion, but I

believe that men like Professor Williams and Dr. Eichhorn of the committee have every opportunity to try it out, and I believe that they may have some good success.

THE PRESIDENT: I believe that you all have questions to ask, but the time is not sufficient. We must leave here, and the balance of these papers according to rule will go over until the end of the session. If there is no objection to that, we will entertain a motion to adjourn until 2 o'clock sharp. We have a heavy program.

Adjournment.

WEDNESDAY AFTERNOON

The meeting was called to order at 2 p. m., President V. A. Moore, presiding.

DR. L. E. DAY (Chicago): Mr. President, this morning in Dr. Eichhorn's report he suggested that $500 be given to further the work of the Committee on Contagious Abortion. I move you at this time that this recommendation be referred to the Budget Committee.

(The motion was seconded by Dr. Hollingworth and carried.)

INTERNATIONAL VETERINARY CONGRESS

DR. MERILLAT: I thought it appropriate at this time to bring before the Association the advisability of providing the veterinarians of the world with a veterinary congress in 1921, and in discussing this subject at the meeting of the Veterinary School of Alfort it was freely expressed that the veterinarians of Europe were so concerned in their temporal welfare that it might be a long while before they would feel able to convene this congress. At that time I stated to Professor Vallée and others that I would bring the matter before the American Veterinary Medical Association, suggesting that you have the meeting convene in the United States, and among those men it met with universal approval. Therefore, Mr. President, I move you that a committee of five be appointed for the purpose of corresponding with the veterinarians of the civilized nations, to obtain their coöperation in this ambition of the American Veterinary Medical Association.

(The motion was seconded by Dr. Kinsley and carried.)

PRESENTATION OF PAPERS

DR. WINCHESTER: This morning's program was not finished, and there are some papers that should have been heard this morning. I move you, sir, that we adhere to the printed program and that those papers that were not heard this morning be heard at a general session which may follow.

(The motion was seconded by Dr. McAuslin.)

THE PRESIDENT: That was decided this morning, that the papers that were unread at this morning's session will come on Friday.

The first paper on the program this afternoon is "The United

States Army Veterinary Corps Service of the Interior," by Col. C. J. Marshall, Philadelphia, Pa. (Applause.)

(At the request of Col. Marshall, Secretary Mayo read his paper. It was published in the JOURNAL for February, 1920.)

THE PRESIDENT: The program calls for the discussion at the end of this series of papers. If there is any question, however, that is in the mind of any member relative to the facts as presented, in order that this may be clear, I think it would be proper that such question might be asked, but that no expression of opinion or discussion should take place until the time for that. Is there any question of that kind in regard to explanation, or question of facts as presented in this paper, that was not clear to those here?

The Chair feels that the importance of these papers does not justify his calling the time limit unless it should be necessary. There is time, I think, for these papers to be presented, and unless it is the wish of the Association that time limit should be adhered to, the Chair will ignore that for this part of the program. Hearing no objection, it will be so ruled.

The next paper is on "The U. S. Army Veterinary Service in France," by Col. H. E. Bemis. (Applause.)

(Colonel Bemis read his paper, which appears elsewhere in this number of the JOURNAL.)

THE PRESIDENT: Are there any questions as suggested in the previous paper?

The next paper called for the use of the lantern. As the lantern needs a little adjustment first, I wish to call upon the fourth speaker —to reverse the next two—if there are no objections. Then, possibly the lantern will be ready. I will ask Major Lytle to present his paper on the meat inspection. (Applause.)

(Major Lytle presented his paper on "The United States Army Meat Supply." It will be published later.)

THE PRESIDENT: The next paper is on "The British Army Veterinary Service," illustrated by certain lantern slides, by Col. D. S. Tamblyn. (Applause.)

(Colonel Tamblyn read his paper, which appears elsewhere in this number of the JOURNAL.)

THE PRESIDENT: Colonel Tamblyn will show the slides this evening. I will now call on Colonel White to open the discussion.

DISCUSSION ON ARMY PAPERS

DR. WHITE: Gentlemen, it was my opportunity to serve my Government as best I could in the late unpleasantness with Germany. An officer of the Regular Army Veterinary Corps wandered out to me in the West in May, 1919, and asked me if I would accept the position of examiner for the State of Ohio for those who desired to join the then Veterinary Officers' Reserve Corps. I examined something like 200 men, 150 of whom complied with the requirements then in force, donned their uniforms and went into the service.

Having reached almost the half-century mark, I felt that that

would be my slight contribution, because I felt that I could do nothing more. My military experience, I will admit, had been limited to four years in the National Guard, and as a member of the cadet regiment, where I never reached a very exalted height, at least not beyond that of the captaincy of an infantry company. At the request, however, of the Surgeon-General, I came to Washington and attempted during the hot summer of 1919 to do a piece of constructive work.

We had absolutely no nucleus around which to build. It was necessary, therefore, in this emergency for us to form a nucleus. The time was fleeting. Hours, even, were precious. Men were dying along the western front while we were attempting to organize over here, and there is no truer saying than the one made by the British officer who was sent here at the request of the Surgeon-General, that every hour of time lost meant that thousands of brave men in the British and French armies would die.

The Surgeon-General made no effort to organize a veterinary service until this country had been at war 4 months. Authority from the War Department was not obtained for the organization created in the interim to function until 8 months had passed after we had entered the war. No adequate organization of the veterinary service overseas had been formed until 2 months and 7 days before the signing of the armistice. So, gentlemen, we got a very late start. I do not wish to apologize for the Advisory Board of which I was a member, or for my own actions. I think, personally, I made every possible mistake that was to be made. These mistakes, however, were due to our lack of the type of military experience which the occasion demanded. They were by no means confined to me, to the Advisory Board, or to the Veterinary Corps, but to every branch of the service.

In 1914, when the great conflagration was consuming Europe, this country had available 400 cannon, a number of guns that would be lost in a single day's battle at the front. We had enough ammunition available to last 20 minutes as it was used at the front. We had a manufacturing capacity of about 50,000 uniforms per year. We had no air service whatsoever. There were not a hundred men in the United States who could run flying machines, and most of these were circus performers. We had no general staff in the European sense. The officers in the Regular Army who had ever commanded as large a body of troops as a division you could count on the fingers of one hand. A great majority of those even who had attained the rank of general had never commanded more than a regiment. If I am exaggerating here, I wish some of you regular officers would correct me. These data are not original with me. They came to me from an officer of the Regular Army who had seen some 40 years' service.

That was our beginning. We had available in the Army approximately 5,000 officers. Our National Guard was a quasi-political organization. When the armistice was signed we had nearly 200,000

officers, and obviously, among those 200,000 the men did the best they knew how. We must remember that in this emergency everybody did the best he knew how. In my 11 months which I spent in Washington I saw no evidence of political or fraternal favoritism. Perhaps I should cite you some concrete instances.

It would become necessary to appoint two division veterinarians. These men carried, according to the schedule, the rank of major. We found, however, that it would be impossible because the Adjutant General of the Army would not allow us to appoint majors only, but with each major must be appointed a certain number of captains and a certain number of first lieutenants. Our plan generally was to promote those first who were in uniform. We didn't know, personally, very much about the men in the Regular Army Veterinary Corps. We left the choice to a representative of that Corps who was at that time in the Surgeon-General's office, and in no case where he recommended that a regular officer be promoted did we for one moment demur.

Then, secondly, we chose men from the Veterinary Officers' Reserve Corps. They were all second lieutenants, and there it was a good deal like drawing cards in a poker game. Therefore we appointed a special committee of two civilians and one medical officer to select from the Veterinary Officers' Reserve Corps and from the civilian veterinarians of the country men who in their opinion were competent to assume the higher ranks. We followed, as best we could, the advice of this committee.

Now, in regard to the Advisory Board. As far as that is concerned, we were after nothing but this, and we still stand on that platform. We want to establish in the United States Army an adequate and efficient veterinary service, and we have a selfish motive in that, which is this: I firmly believe, gentlemen, that if this is accomplished and we have in the Army a corps which is respected in that service and respected by the Nation, every veterinarian in the United States will be benefited thereby. (Applause.) That is where we stand.

Gentlemen, I have faith in the veterinary profession. I believed firmly in the summer of 1917, as I do now in the winter of 1919, that the veterinary profession, as a whole, will make good at any job it is put at within its province to perform. I firmly believe that, and the experience of this war has demonstrated to any "Doubting Thomases" that fact, and I am informed by credible authority that the Chief of Staff of the United States Army and the late Commander-in-Chief of the American Expeditionary Forces have each given testimony that they now realize that the veterinary profession is able to perform its professional functions in the Army as well as out of it, and are willing to grant to us in the United States Army of the future what we acquired in the late war. (Applause.)

THE PRESIDENT: The next speaker is Colonel Merillat. (Applause.)

DR. MERILLAT: Mr. President and members of the Association: As a review of what happened in the A. E. F. hospital, the report

is pitiful. We did make mistakes, lots of mistakes, but those of you who were not in France cannot in any possible way form a least conception of the obstacles that the veterinary service had to undergo there, and in spite of that, I never heard a whole lot of complaint. We didn't have time.

The facts are, gentlemen, as far as my perspective went, that the veterinarians of the United States Army, constituted of men of the permanent Veterinary Reserve Corps, in France made good. They started against obstacles, as I said before, which were difficult to describe. I will relate my experience in the First Army. Really, an officer has no right to speak, because so often the viewpoint of an officer is so small. He has no right to make very many conclusions about what happened. A little officer who has charge of 500 horses, or 200 or 300, who will judge what has happened by his viewpoint—and perhaps he has never saw anything else—why, he is making a guess.

Now, I don't intend to speak about a thing except what happened in the First American Army, an army composed of three army corps and about 20 divisions. It was organized April 1, 1918, and functioned until February 23, 1919.

What happened there, I have a fairly good idea of. The First Army officially on record began August 7, but I was ordered to headquarters on August 1 from Paris, and went by train to the little town of La Ferte on the Marne River as far as the railroads went. I reported to the Chief of Staff who was organizing the headquarters of this new, great big First Army, the first army that ever was organized in the history of the United States. I reported to him as the Chief Veterinarian in company with an officer who ranked as major also, who was Chief Remount Officer.

You will remember the dates—that about August 1st the American Army had been in operation—it was the Second Battle of the Marne—since the 14th of July, so it was now two weeks that they had been fighting the hardest battles in the history of the world. The American Army at that time was under command of the French Army and was constituted of the First Army Corps, commanded by Lieutenant-General Liggett, and some scattering divisions here and there that were being sent in from time to time.

Getting off at the railroad, we reported to the Assistant Chief of Staff, and we were told that the horse condition was very, very bad, that he was very glad to see us. My! I never saw a more pleased man than Colonel Barber when we reported to him to help.

Remember, the First American Army went into the Battle of the Marne without a veterinary service, and we came there on the 1st of August, after two weeks of hard fighting, to help unscramble the terrible turmoil that had occurred from such a thing as that. Our forces were on the Vesle River, as you will remember, in the Soissons triangle between Soissons and Château Thierry. They had railroads between Soissons and Reims, a pretty straight line. The rest of the line was a team base. There was a line of

horses and men and the dying, dead and abandoned. How many, nobody ever counted. I was probably the only surgeon to be found in France. I am one of the men here known as surgeons, and we were supposed to straighten that thing right out, fix it right up. You know that was mighty difficult to do, but still we didn't back down. With the assistance of what veterinary personnel we had, and the hospital that was on the battle field, we succeeded in a few days in clearing up that great area of disabled horses and in shipping them to a hospital which we formed in the rear.

Not knowing how long we were going to stay there, we prepared for a more or less permanent stay. On the 14th of August we were told to get ready to move—where, nobody knew. On the night of August 14 we had to drop everything. We were getting machinery nicely going when we had to move. We were moved 200 miles to Neufchâteau, preparatory to the battle of St. Mihiel. They don't tell us those things in the war, you know. There we soon learned that our job was to create an evacuation station, to look after the veterinary service and other operations.

Remember, during this time we were under the Remount Service. I remember we got a letter from Colonel White—a pretty snappy letter—wanting to know what in the deuce was the matter. The Colonel didn't know that I was still under Remount Service. We were working under the Remount Service. We planned stations, collecting posts, division corps and army stations, to take the animals that would need evacuation, and created a pretty fair machinery out of borrowed troops, parts of troops of cavalry, labor companies, etc. There was one veterinary outfit that we took from the S. O. S.

COLONEL WHITE: Stolen. (Laughter.)

COLONEL MERILLAT: It was Major Blair's outfit. In the battle of St. Mihiel there was something like 4,800 horses that we put up. The machinery worked well, but we were not allowed to use railroads and had to walk horses over the country, and already we had formed some sort of a workable organization.

No sooner was this over than we got another order to move to Verdun, preparatory to the great battle of the Argonne, where the First Army now had a horse effective of about 93,000 animals.

It seems that Colonel White saw, when he came to visit the famous town of Ypres, the result of moving this great army to this new sector, without adequate men to take care of the disabled and sick animals, without adequate transportation to send them back to the veterinary hospitals. I know when Dr. White came to the First Army he had a bad impression of me, but when he looked over the shell-shot and wounded horses and saw the inadequate personnel we had to take care of them with, he was charitable enough to pardon me for all the ugly things he saw.

From that time on, which was now the 26th of September, with an adequate personnel, the First Army built a very creditable veterinary service. The records of the First Army, when they come to

Colonel Stancliffe, I am going to be proud of, and I want you to read them. I would like very much for you to take a great deal of pains with the files of the First Army and see whether after the 26th of September we didn't have a pretty good veterinary service. We had each mobile section where it belonged—and here I am going to speak about something else.

I got an awful roasting from Colonel White. He said the mobile section was 40 miles behind where it belonged. That was the only place you could put it. You know the mobile section belongs in front. One of the greatest troubles that I had in my organization was to get these placed, but the trouble was not of the division's making. When a division is located in one place for three or four weeks, and is told on an hour's notice to move, the horses that can't walk can't move. Therefore, who is going to take care of it? Of course the mobile section had to stay back, because there are two or three hundred horses that can't move. The division moves 40 kilometers. The chief comes along and finds that we are not there. Well, the chief didn't supply us with means of sending the horses. It takes a machinery that is working together all the cogs to prevent calamities. When the Second Division found itself in its nice little home on a farm with 190 horses, the Colonel was very mad, but there was no way at that time for this division to relieve them.

So, right here, in getting up your regulations, don't forget that the division veterinarians must be taken into confidence. They must be one of the first men to know about the moves. That was one of the big sins of omission in the A. E. F. In the division the veterinarian was the horse doctor. Sometimes he was just allowed to be around. He was back at the mobile section. Some of them never went up to headquarters.

As a matter of fact, the veterinarian holds a position so important, as far as army mobility is concerned, that he ought to be one of the first men that is taken into confidence and told where every echelon is to go, so that he can go ahead of everybody and plan to pick up these straggling animals and provide means to get these to a central place and avoid these calamities. They used to say that they could tell the way the division went by the dead and disabled horses along the road. It was a very simple matter to trace us because our division veterinarians would go along and you could see the horses straggling along the road.

Now, I was getting head of my story. We had on the 26th of September the division mobile sections where they belonged. We had behind each group of divisions in the Army Corps evacuation stations, manned with about 100 men, behind the corps. We had three big evacuation stations where we could load at our leisure, and in these two battles, as Colonel Bemis has told you, we evacuated 23,000 horses.

There were a lot of difficulties, but there was no wailing. We had no medicine; oh, no, of course not. It was down at the depot in St. Louis, and there were no bottoms to take it to us. It was neces-

sary to ration our horses less. We did not have an adequate supply of medical supplies in France. We had a lot more than the veterinary officers got. Some of them didn't have the right experience and didn't get the medicine that was there for them. Toward the last of the operations medicines were plentiful.

Now I want to say a word in detail about the Third Army. The Third Army was formed of 9 divisions taken from the First Army, and there were 20 per cent males in the horses in the First Army. I can't quite separate gypsy tactics from the horses. When Foch said that we were to be ordered out, it was a madhouse. The order said, "You must go forward with a 100 per cent army, men, transportation, etc., and you must make a certain objective every day, and be ready to take offensive in 48 hours."

Our army was located close to Verdun. Transportation never existed in that army after the Battle of the Argonne. We found that we must move 26,000 horses in 24 hours. Those are the horses, in part, that Colonel Bemis got from me. The order read, "You must fall in the spirit of this order and give the best horses to the Third Army." You can't make a man give a good horse when there are no good ones. You can't separate the gypsy tactics from the horse business. Colonel Bemis got all the mangy horses there were in the First Army. There were no more mangy horses in the First Army after he got his supply. (Laughter.)

The officers fought evacuation to the finish. We had to pry horses away from them, and consequently they always had a large per cent of mange.

And now I want to say a few words about S. R. 70. S. R. 70 was a failure in France, and was criticized by staff officers justly. It pays too much attention to a division and not enough to an army.

Another very bad mistake in the S. R. 70—Colonel White knows this is my pet kick—is that the mobile section was not an individual. It had to be connected up with something else for rations. That is serious, because this outfit is always hungry. They had to steal all they had to eat. The fact is we were officially attached to the headquarters' troop, and they never were there, so they couldn't draw their rations there.

COLONEL WHITE: The veterinary profession is not to blame for that. Colonel Stancliffe will bear me out. We wanted to make the mobile sections self-contained so that they could be moved anywhere, and in the supply tables which I made up we provided stoves, paraphernalia and everything, but the general staff attached to the train for rations found that that wouldn't work over in France. However, we weren't to blame for that.

COLONEL MERILLAT: Another mistake that was made by Colonel Bemis was that the first six divisions did not have any division veterinarian. They were without any head veterinary service. The Second Division had Sid Montgomery as Chief Veterinarian, and he told me that he was a graduate of Fort Riley. He ought to be able to tell the veterinarians how to treat horses. He sure ought to make

a good veterinarian. He was promoted to a full colonel after that.

The Fourth Division got Major Mitchell very late in the operations, and the Twenty-sixth had Captain Van Alstyne in January, but he hadn't been introduced as Chief Veterinarian; he just had charge of the other veterinarians.

The Third Division was the first division which came to France with Major Clifton. That was the first to come overseas and to have a division veterinarian.

A great amount of the sickness that occurred among the animals was due to the handling in the remount depot. The ordinary way they take care of the horses in the United States Army is that they pen them up like sheep, always in the mud. It is no wonder that they spread contagious diseases. That was the reason. The animals that were delivered direct to the organizations never were so badly affected.

Another thing that ought to be explained is the rail transportation. You will remember they often criticized our lack of use of the railroads in evacuating animals, compared to the British service. You will remember that in the British sectors they had absolute control of the country. They owned their railroads. They had built them. We showed and argued with the staff that these cars coming up by the dozens every day with ammunition and food might just as well be loaded up with horses. But the French had those requisitioned already to go somewhere else. That was what they argued, and they said, "You can't send them out of our reach. We have planned for those." It was not easy to secure a liaison with the French railroad to get these cars up to the front as numerously as we wanted them, and for a long time that operated against us.

I want to pay my compliments to that famous G. O. 39—General Order 39—that was dated in August, 1917. It was a blow under the belt. It was illegal. They had no more right to take the Veterinary Service from the Medical Department than they had to put the dentists in the grave diggers' department or somewhere else. Congress, in their deliberations, had placed it there, and the very men who took it out knew it. It was like the preacher's son, who never took a drink; when he gets a taste he takes too much. These people couldn't play with the Veterinary Corps at home, but when they got out they did as they pleased.

I say here that the writing of G. O. 39 was a deliberate illegal act and never should have been tolerated. Major Klein and Major Mason had no right to come home when the first gun was fired. They should have stayed to help us and not simply run home because one officer in the staff said, "We are not going to do that; you are wasting your time." I would have told them, "I am going to stick around until you do listen to me."

I want to pay tribute and pay a word of compliment in behalf of all of the officers of the A. E. F. that I met. I have heard no complaint from any of them, and they all did the best they could.

Adjourned.

(Proceedings to be continued.)

OTHER ASSOCIATIONS

OHIO PREPARES TO ENTERTAIN A. V. M. A. AT COLUMBUS AUGUST 23-27

FOLLOWING the annual meeting of the Ohio State Veterinary Medical Association meeting in Columbus, January 15 and 16, President O. V. Brumley appointed a Committee on Arrangements which, with the Executive Committee of the State Association, is now busily engaged working out the details for what we hope will prove the largest gathering of the A. V. M. A. in history.

The personnel of this joint Committee on Arrangements is: F. E. Anderson, Findlay; W. A. Axby, Harrison; R. I. Bernath, Wauseon; O. V. Brumley, Columbus; Theo A. Burnett, Columbus; C. H. Case, Akron; S. R. Craver, Youngstown; D. C. Hyde, Columbus; Harry T. Moss, Dayton; W. B. Washburn, Tiffin, and F. A. Lambert, Columbus, Chairman.

At a meeting held in the office of the State Veterinarian on January 24, the various sub-committees were chosen and their work outlined. They are:

Committee on Finance and Appropriations—

C. H. Case, 50 East Buchtel Avenue, Akron, Chairman.
F. E. Anderson, Findlay.
R. I. Bernath, Wauseon.
D. C. Hyde, Columbus, Treasurer.
D. M. Swinehart, Columbus.

Committee on Entertainment (Social)—

T. A. Burnett, Chairman.
B. E. Edgington, Reynoldsburg.
D. J. Frame, Columbus.
R. E. Rebrassier, Columbus.
D. S. White, Columbus.
Mrs. T. A. Burnett, Chairman (entertainment of ladies).
Mrs. O. V. Brumley.
Mrs. B. E. Edgington.
Mrs. D. J. Frame.
Mrs. R. E. Rebrassier.
Mrs. D. S. White.
Mrs. W. R. Hobbs.
Mrs. W. A. Brown.
Mrs. F. A. Lambert.

Committee on Hotels, Convention Hall and Publicity—

F. A. Lambert, 1996 Summit Street, Columbus, Chairman.
W. A. Axby, Harrison.
S. R. Craver, Youngstown.
E. P. Maxwell, Columbus.
L. H. Smith, Columbus.

Committee on Program and Clinic—

O. V. Brumley, Ohio State University, Columbus, Chairman.
W. B. Washburn, Tiffin.
J. H. Snook, Columbus.
J. N. Shoemaker, Columbus.
W. R. Hobbs, Columbus.
J. D. Grossman, Columbus.

Committee on Information, Registration, Transportation, etc.—

H. T. Moss, 710 West Third Street, Dayton, Chairman.
Harry Worcester, Middletown.
Reuben Hilty, Toledo.
W. E. Clemens, Granville.
W. A. Brown, Columbus.
H. W. Miller, Columbus.

From the above it will be seen that the Ohio veterinarians have not underestimated their task of entertaining the A. V. M. A. and are starting early, that everything may measure up to the expectations. Ohio has been asking for the meeting for the past five years and we hope to leave no regret in the minds of those who voted for the 1920 meeting to come to Columbus. The various committees are now perfecting the details of their work. No detailed announcements are ready at this time. Numerous requests have already been received for reservations in the commercial exhibit section. Nothing more definite than that the exhibits will be held in Memorial Hall, East Broad Street, the place of the meeting, can be stated at this time. Until floor plans for the exhibitors' booths are completed no space can be assigned. Announcements will go forth to every known commercial house dealing with the profession as soon as the Committee on Convention Hall has the plans accepted.

The Deshler Hotel has been selected as headquarters and the meetings will be held in the Franklin County Soldiers and Sailors' Memorial Hall. In subsequent issues we will make announcements giving information on hotel reservations, rates, etc.

Communications relative to the arrangements may be addressed to President O. V. Brumley or Chairman F. A. Lambert.

Where the Fifty-Seventh Annual Meeting of the A. V. M. A. will be held Aug. 23-27, 1920. Seating capacity eight thousand.

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS

THE Second Annual Convention of the National Association of Bureau of Animal Industry Veterinarians was held in conjunction with the Fifty-sixth Annual Session of the American Veterinary Medical Association in the city of New Orleans, La., November 17-20, 1919.

The meeting was a thrilling one, from the first session held in the magnificent Gold Room of the Grunewald Hotel, until the final session held on the hurricane deck of the steamer *Sidney* amidst balmy breezes and the enchanting syncopated strains of the jazz orchestra. Every delegate present showed evidence that he attended the meeting for the purpose of contributing to its success and for the purpose of carrying out the policies of the Association, which are dedicated to the building up of the organization and the efficiency of the personnel of the Bureau.

Among the subjects that were discussed in a very able way are the following:

Reclassification of Federal Employees.
The Retirement of Superannuated Officials.
Overtime for Employees of the Bureau.
Death Benefits.

The convention went on record as approving the so-called Macey schedule of salaries for veterinary inspectors and lay inspectors.

It was interesting to most of the members to learn by the Treasurer's report that there was a balance in the treasury at the time of the meeting of $3,517. A statement from the Secretary showed the total membership in the National Association as 1,009 veterinarians out of a total of 1,519. The following table gives the total number of Bureau veterinarians in the Bureau service by zones; also, the number of members of the Association in the respective zones:

	No. B. A. I. Vets. in Zone	*Number of Members*	*Number of Non-Members*
Eastern Zone	392	250	142
Central Zone	396	256	140
Southern Zone	391	253	138
Western Zone	340	250	90
Total	1,519	1,009	510

The following named were elected as officers and members of committees for the ensuing year:

National Officers

President, Dr. N. L. Townsend, New York City.
Vice-President-at-Large, Dr. Henry M. Graefe, Topeka, Kan.
Vice-President, Eastern Zone, Dr. C. S. Rockwell, Philadelphia, Pa.
Vice-President, Central Zone, Dr. M. Guillaume, Chicago, Ill.
Vice-President, Southern Zone, Dr. J. S. Grove, Oklahoma, Okla.
Vice-President, Western Zone, Dr. Gustave Kay, Omaha, Nebr.
Treasurer, Dr. L. Enos Day, Chicago, Ill.
Secretary, Dr. S. J. Walkley, Milwaukee, Wis.

Executive Committee

President, Dr. N. L. Townsend, New York City.
Vice-President-at-Large, Dr. Henry M. Graefe, Topeka, Kan.
Vice-President, Eastern Zone, Dr. C. S. Rockwell, Philadelphia, Pa.
Vice-President, Central Zone, Dr. M. Guillaume, Chicago, Ill.
Vice-President, Southern Zone, Dr. J. S. Grove, Oklahoma, Okla.
Vice-President, Western Zone, Dr. Gustave Kay, Omaha, Nebr.
Secretary, Dr. S. J. Walkley, Milwaukee, Wis.

Committee on Legislation and Publicity

Dr. J. A. Kiernan, Washington, D. C., chairman.
Dr. Clark H. Hays, Indianapolis, Ind.
Dr. James Fleming, Kansas City, Kan.
Dr. W. K. Lewis, Columbia, S. C.
Dr. Herman Busman, Omaha, Nebr.

Committee on Salary Classification Schedule

Dr. James Fleming, Kansas City, Kan., chairman.
Dr. S. O. Fladness, Washington, D. C.
Dr. J. B. Johnson, Louisville, Ky.

Committee on Constitution and By-Laws

Dr. C. S. Rockwell, Philadelphia, Pa., chairman.
Dr. Edward Horstman, Baton Rouge, La.
Dr. Howard C. Wilson, Troy, Ala.
Dr. Henry M. Graefe, Topeka, Kan.
Dr. Joe H. Bux, Little Rock, Ark.

BRITISH COLUMBIA VETERINARY ASSOCIATION

THE British Columbia Veterinary Association has taken up the matter of the practice of "plugging" of cattle before the arrival of the government inspectors to apply the tuberculin test and have drawn up some amendments to the Provincial Contagious Disease Animals Act embodying the following features:

1. Sale of tuberculin by druggists to be confined to veterinary surgeons only, name and address and amount purchased to be taken down at time of sale.

2. No person other than a veterinary surgeon, licensed in British Columbia, shall inject cattle with tuberculin.

3. Every veterinary surgeon injecting cattle with tuberculin shall report to the nearest government inspector within 48 hours after the completion of the test, the description of the animal, the name of the owner, and the result of the test.

4. Penalty for breach of above, fine of $500.

Lastly, when the above amendments become law, to petition the Hon. Dr. S. F. Tolmie, Dominion Minister of Agriculture, to take steps to prohibit the importation of tuberculin into British Columbia, except under license from the Department of Agriculture.

The above resolution was submitted to the executive of the British Columbia Dairyman's Association by a committee consisting of Drs. Brooks, Howell, Jagger and Chester, with a suggestion that they bring the matter up at their annual convention in January

and a request that they endorse them, when they would be then forwarded to the Provincial Government.

The amendments were passed by the resolution committee of the B. C. Dairyman's Association and were debated in open convention, the president calling upon Dr. T. H. Jagger to explain the necessity for same. The motion to endorse the resolution was put and carried, and the secretary has so forwarded them to the Provincial Government and is in receipt of a letter from Dr. D. Warnock, Deputy Minister of Agriculture, that the amendments are being drafted by his legal department and he will forward to the B. C. Veterinary Association a copy when completed, and we expect they will be made law at the present session.

The British Columbia Veterinary Association at their meeting on January 17, 1920, received a communication from one of its members, Dr. C. E. Edgett, late director Canadian Army Veterinary Services, now practicing at Vernon, B. C., asking the Association to endorse a resolution and forward it to the Militia Council at Ottawa, that the Canadian Army Veterinary Service in Canada be placed in charge of a qualified veterinary surgeon, as it has not been so in the past. This was done and the Association is in receipt of a letter from Major General H. Burstall stating that under the reorganization of the Canadian Army Veterinary Services, now under consideration, it is intended to appoint an officer who is a fully qualified veterinary surgeon to administer these services.

KENNETH CHESTER,
Secretary-Treasurer.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION

AT the recent meeting of the Minnesota State Veterinary Medical Association a committee was appointed to meet with the county agents. This committee met with the county agents and drew up the following report, which was adopted.

C. P. FITCH, *Secretary.*

CONTROL OF ANIMAL DISEASES

Policy

Cooperate to the fullest extent with the local qualified practitioner of veterinary medicine and the State Live Stock Sanitary Board in the diagnosis of diseases of live stock. Report immediately every

outbreak of contagious or infectious diseases to the proper authorities and lend every assistance possible looking to the control and eradication of all such diseases. It shall be the duty of the practicing veterinarian to report all outbreaks of contagious and infectious diseases of live stock to the local farm bureau office as well as to authorities as required by law.

Method in Reaching Results

Realizing that skillful technical service is necessary in the use of serums, virus and vaccines, it is recommended that county agents advise farmers to secure the services of skilled veterinarians immediately in administering the above, and report the outbreak to the proper authorities, and assist them in the establishment of proper quarantine in order to prevent the spreading of the infection.

It shall also be the duty of the agents to cooperate with the local veterinarian and county health officer in advising and assisting the owner in carrying out a rigid practical quarantine and in the cleaning and rendering the enclosures and stables sanitary and in the proper disinfection of the same before the release of quarantine.

It is recommended that county agents and veterinarians make every effort possible to secure the tuberculin testing of all purebred cattle offered for breeding and dairy purposes at breeders' sales and all dispersal and private sales, and to educate the public that the law of the State requires such test before delivery of such animals.

It is suggested that both veterinarians and county agents have the same instructions for general farm disinfection.

Committee

County Agents—F. L. French, Redwood County; J. J. McCann, Pennington County; P. A. Johnson, Martin County.

Practicing Veterinarians—A. F. Lees, Red Wing; M. R. Higbee, Albert Lea; A. E. Hoffman, Detroit.

Live Stock Sanitary Board—C. E. Cotton.

Chief Veterinary Division—C. P. Fitch.

Assistant County Agent Leader—J. S. Jones.

COLORADO VETERINARY MEDICAL ASSOCIATION

THE Seventeenth Annual Meeting of the Colorado Veterinary Medical Association was held on January 22 with a rather large proportion of the membership present. Although the legislature of Colorado does not meet until January, 1921, the subject of legislation was discussed before the meeting with a view to having all necessary preliminary work done before the next session.

The bill for cooperating with the U. S. Government on the accredited herd plan in eliminating tuberculosis was approved and

the legislative committee asked to lend its assistance in passing the bill.

The bill providing for the establishment of county veterinarians where the population was thin and where some subsidy was needed for the location of a practitioner, was approved.

Dr. Spaulding, of Utah, informed us that it had been his experience that the testing of cattle under the accredited herd plan did not remove work from the local practitioner, but actually increased his efforts in this direction, since it stimulated much tuberculin testing outside of accredited herds that would not otherwise have been done.

The committee which had been appointed to determine the possibility of a uniform price for the administration of biological preparations reported that it was their opinion that a uniform price was not feasible owing to the great differences in cases and also in practices in different localities.

Four new members—Drs. J. M. Twitchell, of Center; G. W. Cooper, of Roggen; Bruce Baker, of Meeker, and J. R. Grigsby, of Wray—were elected.

A committee was appointed to collect data with a view to extending an invitation to the American Veterinary Medical Association to meet in Colorado in 1921.

Much discussion was given to the project of a short course for practitioners to be held at the Colorado Agricultural College some time in June. It was finally left to a committee consisting of the veterinary faculty of the college, with instructions to the secretary to send out a questionnaire for the purpose of determining how many members might be expected to attend.

The matter of raising money for prosecuting illegal practitioners was left to the officers of the association, with instructions to levy an assessment if found feasible.

The following officers were elected for the following year: Drs. A. N. Carroll, president; J. F. Meinzer, first vice-president; W. H. Feldman, second vice-president, and I. E. Newsom, secretary-treasurer. Executive Board, Drs. A. B. McCapes, T. H. Brady and E. E. Tobin.

Dr. G. M. Potter, extension veterinarian at the Agricultural College of Kansas, read a paper on "The Relation of the Veterinarian to Agricultural Extension," in which he discussed in a very reasonable manner this rather delicate question. The chief point of his paper was that agricultural extension had come to stay, and that

cooperation between the veterinarians and county agents was the proper solution of the whole problem. This cooperation he maintained might be an individual matter between the veterinarian and county agent in any particular locality or a declaration of principles might be arranged between veterinary organizations and extension directors outlining the scope of the county agent's activities. Following the paper, a committee was appointed, consisting of Drs. Kingman, Fisk and Morgan, to take up the matter with the extension service at the Colorado Agricultural College with a view to maintaining the excellent relations which already exist between these two activities in this State.

The matter of an accredited herd plan and tuberculin testing under it was discussed by Dr. W. E. Howe.

Dr. H. E. Kingman read a paper on "Immunization of Hogs at the Denver Stockyards," in which he discussed the regulations now in effect and their influence on the spread of the disease and on the veterinarians outside of Denver.

The horse disease, otherwise known as forage poisoning and cerebro-spinal meningitis, which caused the loss of some 2,500 horses in the State last summer, was given most attention at the meeting in papers by Drs. G. W. Stiles, O. B. Morgan and J. D. Paxton, and in discussion by nearly every member present. The consensus of opinion was that while no cause of the disease had been firmly established, yet early treatment did seem to be effective in a considerable proportion of cases.

I. E. NEWSOM, *Secretary.*

MISSISSIPPI STATE VETERINARY MEDICAL ASSOCIATION

THE Fourteenth Annual Meeting of the Mississippi State Veterinary Medical Association convened in the Rotary Room of the Edwards Hotel, Jackson, Miss., February 10 and 11, 1920. There were in attendance during the session 83 members and friends.

The meeting was called to order by the president, Dr. E. S. Norton, at 9:30 a. m. The president introduced Governor Lee M. Russell, who made a splendid address of welcome. After speaking at length, Governor Russell closed by paying high tribute to the ability of the local practicing veterinarians working cooperatively with the veterinarians of the State and Federal forces in the control of animal diseases.

Dr. C. A. Cary, President of the A. V. M. A. and State Veterinarian of Alabama, was then introduced and made response to the address of welcome in a most appropriate manner. Dr. Cary in the course of his address showed clearly the economic necessity of the veterinarian in the control of animal diseases.

During the meeting addresses were delivered by the following veterinarians:

Dr. E. B. Green, Hattiesburg, Miss., "Experiences of a Veterinarian in the Late War." This subject was discussed by Dr. E. B. Jordan, West Point, Miss.

Dr. T. A. Sigler, Professor of Parasitology, Indianapolis Veterinary College, Indianapolis, Ind., "Intestinal Parasitic Diseases of Cattle and Hogs."

Dr. W. N. Cochran, Indianapolis, Ind., "Some Factors Which Determine the Potency of Bacterins in the Treatment of Acute Diseases."

Dr. W. J. Luster, Clarksdale, Miss., "Shipping Fever."

Dr. J. J. Jones, Jackson, Miss., "Cooperative Tuberculosis Eradication Work."

Dr. Tom Eagle, Oklahoma, Okla., "Hog Cholera and Its Control."

Dr. J. T. Alston, Tupelo, Miss., "Hemorrhagic Septicemia of Swine."

Dr. G. B. Bradshaw, Mobile, Ala., "Uncinariasis in Calves."

Unusual interest was manifested in the subjects discussed. Dr. E. B. Jordan, in discussing tuberculosis work, stated that if there were no fish in the pond the best angler in the world could not get a bite, but if the pond was filled with fish, the poorest fisherman in the country could catch all he needed. He continued that before cooperative tuberculosis work was taken up in his county, Clay, there was very little testing, but now he stated the people are anxious to have it done.

Dr. Henry Boswell, superintendent of the State Tuberculosis Sanitorium, gave a glowing description of the work of his institution, and stated that it was necessary to control tuberculosis among cattle before the disease could be suppressed in the human family.

On the night of February 10 a sumptuous banquet was served at the Edwards Hotel to eighty members and their friends. Several members of the State Legislature were present and responded becomingly to various toasts.

At noon the second day of the meeting the members were guests of Messrs. Enochs & Wortman, at their Hereford farm, near Jackson,

where a splendid lunch was served, after which a weight-guessing contest was engaged in, prizes being offered for the best guessers on the correct weights of Dolly Rupert and Jolly Donald, prize-winning cow and bull. While at the farm Dr. T. A. Sigler operated upon several valuable cows for sterility, and with the assistance of others removed a tumor from the eyelid of a cow.

During the meeting a resolution was adopted requesting the several Members of Congress from this State to support such measures as will rank veterinary officers in the United States Army from first lieutenant up to and including colonel and which would otherwise conform to the recommendations of the Surgeon General of the Army with reference to this matter.

The following officers were elected for the ensuing year: President, Dr. J. T. Alston, Tupelo; vice-president, Dr. W. P. Ferguson, Grenada; secretary-treasurer, Dr. J. A. Barger, Jackson.

The next meeting of the association will be held at Canton, Miss., during the latter part of January or the first of February, 1921.

J. A. BARGER, *Secretary-Treasurer.*

CENTRAL CANADA VETERINARY ASSOCIATION

THE Seventeenth Annual Meeting of the Central Canada Veterinary Association was held on January 14 last, in the Council Chamber, City Hall, Ottawa.

The meeting consisted of morning, afternoon and evening sessions, together with the usual dinner.

Unfortunately, the attendance was not up to the average, many factors, such as the interprovincial vaccination requirements, being responsible for the absence of many members. Nevertheless, the association is growing, as is evidenced by the fact that four new members were initiated into the good graces of the society.

The morning session was taken up with registration and a few items of business, mostly dealing with legislation.

The afternoon session was taken up with all unfinished business, such as the reading of the minutes and legislative discussion, the latter being principally dealt with by Dr. C. D. McGilvray, dean of the Ontario Veterinary College, and Dr. W. J. R. Fowler, Toronto, Ont. The following papers were also presented and discussed:

"Ensilage Intoxication of Cattle," by Dr. A. W. Harris, Ottawa, Ont.

"Practical Meat Inspection," by Dr. F. H. S. Lowrey, Ottawa, Ont.

"Parasitic Skin Diseases of Army Horses," by Lieut.-Col. T. C. Evans, Ottawa, Ont.

Among those at the afternoon session were Dr. J. G. Rutherford, C. M. G., Railway Commissioner for Canada, and Dr. F. Torrance, Veterinary Director General.

The meeting adjourned at 6:30 p. m. for dinner, which was held in the dining-hall of the Daly Company, Ltd. About forty-five members and guests were in attendance, the latter including Dr. J. A. Amyot, Deputy Minister of Public Health; Dr. J. H. Grisdale, Deputy Minister of Agriculture; Dr. C. D. McGilvray, principal of the Ontario Veterinary College; Dr. T. A. Lomer, medical health officer, Ottawa; Rev. J. C. Lindsay, Ottawa; H. S. Arkell, Live Stock Commissioner for Canada; Dr. W. J. R. Fowler, Toronto, and others.

A well-balanced program contributed to the success of the social entertainment. Habitant recitations by Mr. J. Cooke, Scotch songs by Mr. T. Hamilton, Irish melodies by Mr. Baker, and instrumental selections by Mr. Tattersall were greatly enjoyed.

The remainder of the evening was taken up with a discussion of the following subjects:

"Intestinal Parasites of Domestic Animals," by Dr. S. Hadwen, Biological Laboratory, Ottawa.

"Contagious Abortion of Cattle," by Dr. C. M. Higginson, Hawkesbury, Ont.

This latter subject, which is of universal interest, provoked a lengthy discussion which brought forth many helpful suggestions for combating the affection.

Altogether, the meeting was a thoroughly enjoyable one, and expressions of commendation were heard on all sides for the untiring efforts of the executive members in establishing another memorable milestone in the history of the Central Canada Veterinary Association.

The executive members for the current year are as follows:

Honorable President, Dr. F. Torrance, Veterinary Director General, Ottawa; President, Dr. George Hilton, Ottawa; Vice-President, Dr. J. M. Bordeau, Embrun, Ont.; Secretary-Treasurer, Dr. A. B. Wickware, Ottawa, Ont. Council—Drs. Hollingsworth, Hall, Barnes, Marriott, Sparks, Ottawa; McGuire, Cornwall, Ont.; Metcalfe, Vankleek Hill, Ont. Auditors—Drs. Hadwen and Kennedy.

W. B. WICKWARE, *Secretary.*

PRINCE EDWARD ISLAND VETERINARY MEDICAL ASSOCIATION

MEMBERS of the veterinary profession of this Province met in Charlottetown on Tuesday, January 13, 1920, for the purpose of discussing the advisability of establishing a protective and educational association.

Dr. W. H. Pethick, the dean of the profession in this Province, was unanimously selected as Chairman, and Dr. K. W. McKinnon as Secretary of the meeting.

The Chairman called upon Dr. J. A. Allen to open the discussion. Dr. Allen briefly traced the history of the profession's fight for legislation in other Canadian Provinces, and remarked that it was regretable that Prince Edward Island was the only Province following the lethargic example of Ontario, the result being that men were from time to time added to the ranks of unqualified practitioners. Fortunately, however, the problem of quackery in Prince Edward Island is not as discouraging as that of Ontario, and if the proper steps are taken it is his belief that legislation could be obtained at the coming session of the Provincial Parliament.

Dr. Allen also gave a brief outline of the methods to be adopted in seeking legislation. It was manifestly impossible to secure protection because of the antagonism of rural members of Parliament and the empiric practitioners, unless some plan could be devised to register or license the unqualified men who were already dependent upon the treatment of disease for a livelihood. The speaker further stated that the first essential was to form an association, and in order to get the movement launched and put in concrete form a motion was adopted that an association to be known as the Prince Edward Island Veterinary Medical Association be immediately organized.

Dr. Pethick was unanimously chosen for the presidency. He at first declined, but eventually yielded to the sincere opinion of the meeting that it was most fitting that the dean of the profession in this Province should be selected for the honor. The other officers appointed were: Vice-President, Dr. A. A. Leckie; Secretary-Treasurer, Dr. K. W. McKinnon.

The first formal meeting of the Association was then opened for business. The problems of veterinary legislation and the status of the unqualified practitioners were thoroughly discussed by Drs. Croken, Bousfield, Bright, McKinnon and Derome, and it was unanimously carried that the executive be appointed a committee to in-

terview the representative lay practitioners with the view of determining their attitude and the terms upon which a cooperative effort could be made for the desired protective legislation. It was further decided that before the executive consummated any agreement between the profession and lay practitioners a combined meeting be held in Charlottetown, at which the whole matter would be discussed and the terms of the agreement formally ratified.

On the motion of Drs. Bousfield and Croken, it was decided that the executive be empowered to consult the executive of the associations of the medical, dental and pharmaceutical professions for the purpose of obtaining the cooperation and moral support of the members of these professions in our efforts to obtain governmental recognition.

All members attending the meeting, with Dr. Allen as Chairman, were appointed a committee to draft by-laws to govern the deliberations of the Association.

Upon the suggestion of Dr. Pethick, the Secretary was instructed to communicate with the authorities of the various Provinces and obtain copies of the acts controlling veterinary practice in these Provinces.

Letters of regret for inability to attend and promising ardent support of the movement were received from Drs. W. G. Church and F. S. McDonald.

In closing the meeting Dr. Pethick thanked the members for the honor of the appointment and promised his faithful service in furthering the interest of the profession. Dr. McKinnon also promised to work ardently for the cause and to support the President in all his activities.

K. W. MCKINNON, *Secretary.*

RHODE ISLAND VETERINARY MEDICAL ASSOCIATION

THE Rhode Island Veterinary Medical Association held its annual meeting at the Hotel Dorrance, Providence, R. I., in January. An interesting series of papers were presented and fully discussed, after which the election of officers for the ensuing year was taken up, resulting as follows:

President, Dr. J. M. Armstrong; First Vice-President, Dr. J. S. Pollard; Second Vice-President, Dr. C. T. Frey; Secretary, Dr. G. L. Salisbury; Treasurer, Dr. T. E. Robinson; Finance Committee, Drs. Pollard and Frey; Legislative Committee, Dr. C. T. Frey, Dr. T. E. Robinson, Dr. G. L. Salisbury, Jr..; Committee on Diseases,

Dr. J. D. Jones, Dr. C. Horseman; members of the Executive Committee, in addition to the board of officers, Dr. J. M. Heard, of Newport, Dr. E. J. Cole, of Pawtucket.

Matters of interest relative to the animal health of the State were brought before the meeting and ably discussed. We will hold the mid-summer meeting the second Tuesday in June.

G. L. SALISBURY, JR., *Secretary.*

ALLEGHENY VETERINARY CLUB

THE February meeting of this club was marked by an interesting address on "The Diseases of the Rumen in Bovines" by Dean Louis A. Klein of the University of Pennsylvania. During the free discussion which followed Drs. Shenk and James A. Waugh described derangements of digestive organs observed recently in cows in advanced pregnancy shipped from Wisconsin. Dr. Waugh explained the dearth of literature on this subject and suggested that someone should write an article on this condition for the JOURNAL.

JAMES A. WAUGH.

CONNECTICUT VETERINARY MEDICAL ASSOCIATION

The Connecticut Veterinary Medical Association held its annual meeting in Hartford at the Hotel Garde on February 3, when the following officers were elected:

President, Dr. A. W. Sutherland, Bristol; first Vice-President, Dr. J. L. Devereaux, Waterbury; second Vice-President, Dr. G. L. Cheney, New Haven; Secretary, Dr. George E. Corwin, Hartford; Treasurer, Dr. Thomas Bland, Waterbury.

Twenty-five members of the Association were present and heard the report of the American Veterinary Medical Association's meeting at New Orleans, given by Mr. James M. Whittlesey, Commissioner on Domestic Animals.

It was voted to hold the next quarterly meeting in Waterbury on May 4.

GEO. E. CORWIN, *Secretary.*

MAINE VETERINARY MEDICAL ASSOCIATION

THE twenty-seventh annual meeting of the Maine Veterinary Medical Association was held at the Augusta House, Augusta. Me., January 14, 1920, with 26 veterinarians present.

Officers elected for the ensuing year were: President, Dr. W. H. Lynch; Vice-President, Dr. C. F. Davis; Secretary, Dr. P. R. Baird.

The following papers were presented and fully discussed: Anthrax, by Dr. M. E. Maddocks of Augusta, Me.; cystic ovaries, by Dr. H. B. Wescott of Portland, Me.; glanders, by Dr. A. J. Neal of Dover, Me.; sterility, by Dr. P. R. Baird of Waterville, Me.

The Association voted to contribute $50 to the Salmon Memorial Fund.

It is very gratifying to the members of the Maine Association to have one of its members again occupying the office of State Live Stock Sanitary Commissioner. Dr. W. H. Lynch of Portland, Me., began his duties January 1st.

The next meeting will be held at the State House, Augusta, Me., in April. P. R. BAIRD, *Secretary and Treasurer.*

CATTLE-FEVER TICKS AND METHODS OF ERADICATION. By W. P. Ellenberger and Robert M. Chapin. Farmers' Bulletin 1057, U. S. Dept. of Agriculture. Pp. 32, figs. 5. Free.

STOCK-POISONING PLANTS OF THE RANGE. By C. Dwight Marsh. Bulletin 575, U. S. Dept. of Agriculture. Reprint with slight revision, 1919. Pp. 25, pl. 30. For sale by Supt. of Documents, Government Printing Office, Washington, D. C. 50 cents.

A concise description of the more important poisonous plants of the range country, illustrated with 16 plates in colors and 14 in halftone.

TUBERCULOSIS IN LIVE STOCK. DETECTION, CONTROL AND ERADICATION. By J. A. Kiernan and A. E. Wight. Farmers' Bulletin 1069, U. S. Dept. of Agriculture. Pp. 31, figs. 21. Free.

STATE SANITARY REQUIREMENTS GOVERNING ADMISSION OF LIVE STOCK. Compiled from reports of accredited officials of each State. Bureau of Animal Industry, U. S. Dept. of Agriculture. Pp. 67.

This is a concise compilation based on the laws and regulations of the various States. It contains information useful to official veterinarians and others concerned in the inspection of live stock for interstate movement.

MISCELLANEOUS

COMPLAINTS FROM MEMBERS

DURING the past six or eight months the Secretary has received a large number of complaints from members who have not received their copies of the JOURNAL regularly. In every case the matter has been taken up and referred to the Editor of the JOURNAL. The member has also been notified.

During the past two years a large number of members, particularly those who have been in the Army Service have changed their addresses frequently, and this probably accounts for some of the failures to receive the JOURNAL. It must also be remembered that following the New Orleans meeting it was necessary to move the JOURNAL office and all of the equipment to Washington, and this has seriously hampered the new Editor in getting the mailing list of the JOURNAL straightened out. Some of the boxes, I am informed, were broken in transit and both cards and stencils became sadly mixed and confused. Since January, over 1200 changes of address have been made by the Editor, so the mailing list at this rate will soon be in good shape.

In all cases where the Secretary receives a notice of a change of address of a member, the changes are made on the books in the Secretary's office and a notice also sent to the Editor of the JOURNAL. Carbon copies of such notices have been kept.

It is important that members should keep the Secretary or the Editor advised correctly as to their change of address. If you are not receiving the JOURNAL, notify the Editor, and he will give it prompt attention. The writer knows that the new Editor has had a tremendous task on his hands, but he is also making a strenuous effort to get the mailing list straightened out and to keep it revised up to date.

N. S. MAYO,
Secretary.

STOCK REMEDIES, TONICS AND NOSTRUMS

FARMERS who lose money by the indiscriminate purchase of stock remedies, tonics and nostrums would do well to get the advice of a reputable veterinarian for diagnosis prior to such purchase, suggests Prof. B. A. Dunbar, head chemist of the South Dakota Experiment Station.

Professor Dunbar reports that analyses of the flood of tonics and stock foods that have come to the chemistry department show the main ingredients to be about as follows:

"They usually carry a large percentage of common salt; a laxative such as Epsom salts, Glauber's salts, and the like; sulphur; charcoal or other form of carbon; sulphate of iron as a tonic vermifuge, and usually a filler by way of mill feeds, oil meal, screenings, grass seeds, peanut shells, sand or tankage. We usually find a very small quantity of a mild drug like gentian, fenugreek, ginger or pepper.

In the light of these findings, it would seem that if the farmer lacks access to a regular veterinarian he might well buy such drugs locally and serve them to his stock in small doses, thereby having the satisfaction of knowing just what he is feeding, as well as knowing that the real food value of his ration is in the form of feed grown upon his land and of a known quality.

It is but fair to add, however, that the extra care given to animals under treatment has produced its good results, because we usually heed advice that we pay a high price for. Almost invariably the directions accompanying the sale of patent stock remedies and foods demand unusual attention to the sanitary and feeding conditions which must be observed during treatment. I doubt not that this feature of extra care and control of animals alone has contributed much to the health of the stock. Whatever we may say of the value—or the lack of it—of these remedies, we must admit that this unusual care will have its good effect.

Several of our experiment stations have tried out stock feeds in actual practice, and under the best possible conditions of sanitation and surroundings but two of twenty or more trials showed that there was any material improvement to be gained from the use of the feeds, and these results are open to question.

In so far as these materials may lay claim to a large value as extra nutrients, we cannot admit them to our confidence, since whatever constituents they may carry are present in such small amounts as to make this claim inconsiderable Again, such doses of condimental materials or medicinal drugs as are found in the ordinary rations of these materials are so slight as to have little marked effect along the line suggested by the presence of the drug. In administering the same medicines, a veterinarian would not recognize the quantities as found in these remedies as at all sufficient."